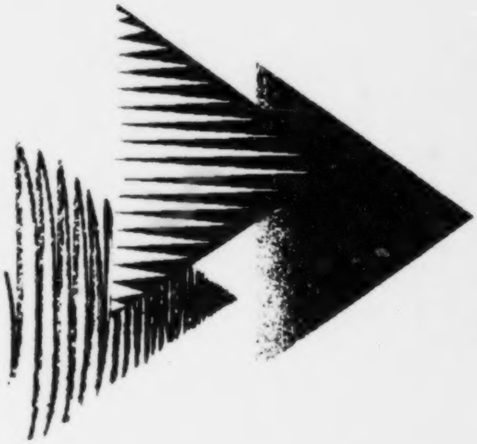

CAREER & TECHNOLOGY STUDIES

MANUAL FOR ADMINISTRATORS, COUNSELLORS AND TEACHERS

Alberta
EDUCATION

AUGUST 1997 (INTERIM)

This document was prepared for:

Administrators	✓
Counsellors	✓
General Audience	
Parents	
Students	
Teachers	✓

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Questions or comments about this Manual for Administrators, Counsellors and Teachers are welcomed and should be directed to:

Career and Technology Studies Unit, Curriculum Standards Branch,
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Telephone: 403–422–4872*, Fax: 403–422–0576

*Alberta Government offices can be reached toll free by dialing 310-0000.

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The manual is also available on Internet:

CTS is on the Internet.
URL: http://ednet.edc.gov.ab.ca
Click on "Students & Learning," then "Student Programs."

Warning: Check memory capacity on your computer before downloading CTS documents.

In addition to reviewing draft documents and providing input during curriculum development, many of the 2400 (January 1995) members of the **CTS Communication Network** raised concerns and provided suggestions about matters related to implementation of CTS that affect teachers, counsellors and administrators. We have tried to address these within this Manual.

For further information about CTS and about specific program planning, contact:

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education, Devonian Building West, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.
Telephone: 403–422–4872*, Fax: 403–422–0576

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Send Us Your Comments

We would appreciate receiving your comments about this manual. We would especially like to know:

Which topics require additional information or clarification?

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Which topics should be deleted?

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Which questions or issues need to be addressed?

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Additional comments:

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TABLE OF CONTENTS

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Appendices	
1. Scope and Sequence Charts and Module Descriptions	August 1997
2. Tracking and Reporting Student Achievement in CTS	August 1997
3. CTS in Junior High	August 1997
4. Making Connections in CTS	August 1997
5. Strategies for Implementing CTS	August 1997
6. CTS Module Parameters	August 1997
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8. CTS - IOP Connections	August 1997
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11. CTS Student Learning Guide Directory	August 1997
12. Assessing Student Achievement in CTS	August 1997
13. Standard Health and Safety Practices for CTS	August 1997
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Note:

- This manual is a support document that supplements other CTS documents, including the *Career and Technology Studies Program of Studies* and the *Guide to Standards and Implementation* for each strand. The *Guide to Education* and *Program of Studies* sets out the legal or prescriptive components of CTS.
- This manual may not answer all of your questions. You may wish to refer to *Guide to Education, ECS to Grade 12 Handbook 1997* for further information.

A. CTS Program Overview

What is CTS and Who is Affected by It? A–1
Why and How was CTS Developed? A–1
How is CTS Organized and What are Its Key Features? A–4
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This section of the manual provides an overview of the Career and Technology Studies (CTS) program rationale, development goals and project management.

What is CTS and Who is Affected by It?

CTS is a competency-based, modular curriculum designed as a complementary program for Alberta's secondary school students.

CTS has affected secondary schools in Alberta. The program is offered to Grade 7 to 12 students using school-based and community-based resources. Full implementation of CTS across the province occurred in September 1997.

CTS is a program of choice.

Analysis of past enrollments indicates that 100 percent of students will earn at least 3 credits in CTS before graduating from high school, and approximately 50 percent will earn 20+ credits. As CTS is implemented across the province, we anticipate an increase in these enrollments.

Why and How was CTS Developed?

CTS was developed to help all secondary students develop the competencies they need:

- to build personal living skills
- to successfully enter the workplace or related post-secondary programs.

Students in CTS will:

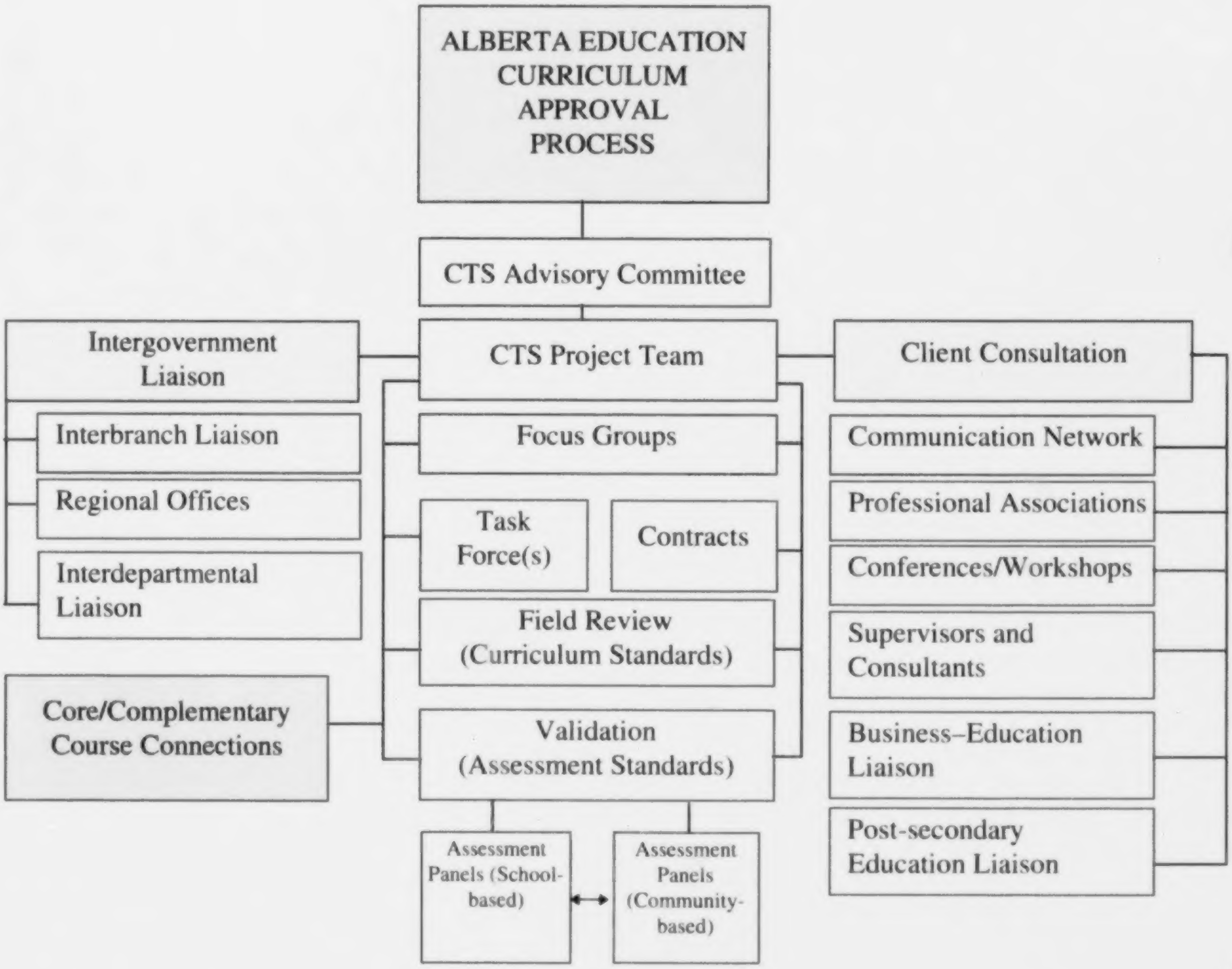
- develop skills that they can apply in their daily lives now and in the future
- refine career-planning skills
- develop technology-related skills
- enhance employability skills
- apply and reinforce learnings developed in other subject areas.

Following the Practical Arts Review in 1988, the CTS program was approved for development. The development process has involved extensive input and support from key interest groups during the curriculum development, validation and implementation phases.

For more complete information on the many individuals and groups involved in the curriculum development process, refer to Section K of each strand's *Guide to Standards and Implementation* or contact the CTS Unit, Alberta Education.

Chart A-1 outlines the interrelationship of the various groups involved in the development process.

Chart A-1: Groups Involved in the CTS Curriculum Development and Approval Process


ALBERTA EDUCATION CURRICULUM APPROVAL PROCESS
CTS Advisory Committee
Intergovernment Liaison
CTS Project Team
Client Consultation
Interbranch Liaison
Regional Offices
Interdepartmental Liaison
Focus Groups
Task Force(s)
Contracts
Field Review (Curriculum Standards)
Validation (Assessment Standards)
Core/Complementary Course Connections
Communication Network
Professional Associations
Conferences/Workshops
Supervisors and Consultants
Business–Education Liaison
Post-secondary Education Liaison
Assessment Panels (School-based)
Assessment Panels (Community-based)

The CTS curriculum is designed to improve the **access**, **relevance** and **credibility** of existing complementary programs and to increase a school's ability to respond to the rapid changes underway in our society.

> *"We must now educate people in what nobody knew yesterday and prepare people for what nobody knows yet but which most people must know tomorrow."*
>
> *– Margaret Mead*

Consult the *Career and Technology Studies Program of Studies* for more information about CTS rationale and philosophy.

Some of these changes, listed below, were identified in the Practical Arts Review (1988–90). They significantly affected how the CTS curriculum was structured and helped define which learning expectations were included in the program.

Demographics:	• aging populations • rural to urban migration • slower population growth
Family structures:	• more single-parent families • rising divorce rates • more women in the work force • increasing teen pregnancies • more interfaith marriages
Changing educational systems:	• increasing expectations and cost of education • aging teaching profession • increasing demand for special education • changes in student achievement
Economy and work environment:	• changing technology • increase in the service industry • fluctuations in the global economy
Impact of information technologies	• greater impact of technology on learning • increasing knowledge base • increasing home access to information technologies.

How is CTS Organized and What are Its Key Features?

Curriculum Structure

The CTS curriculum is organized in *modules* and *strands*.

Chart A - 2 indicates the number of modules within each strand.

Chart A-2: Curriculum Structure

Strand	Modules
Agriculture	33
Career Transitions	28
Communication Technology	33
Community Health	31
Construction Technologies	46
Cosmetology	58
Design Studies	31
Electro-Technologies	37
Energy & Mines	26
Enterprise & Innovation	8
Fabrication Studies	41
Fashion Studies	29
Financial Management	14
Foods	37
Forestry	21
Information Processing	48
Legal Studies	13
Logistics	12
Management & Marketing	19
Mechanics	54
Tourism Studies	24
Wildlife	17

A ***module*** defines what the student is expected to know and be able to do. Each module is **designed** to take a student approximately 25 hours to complete, although some students may need less or more time. At the senior high school level, one module equals one credit.

Components of the CTS curriculum:

- *module*: smallest unit of learning
- *strand*: combination of modules targeting a career area
- *course*: combination of modules organized by teacher to deliver instruction.

Levels in CTS modules:

- *introductory*: builds daily living skills and is the basis for further study
- *intermediate*: allows students to identify and assess more career options
- *advanced*: prepares for workplace/post-secondary transitions.

Modules are organized into three levels: introductory, intermediate and advanced. Students are expected to demonstrate higher degrees of competency and meet higher standards as they move through the module levels.

Each module has a unique code number based on the strand and level. For example, AGR stands for the Agriculture strand, CTR for the Career Transitions strand. Modules are numbered 1010 1020 etc., for introductory level modules, 2010 2020 etc., for intermediate levels modules, and 3010 3020 etc., for advanced level modules.

Note: Module numbers are not always sequential. Some numbers for modules were used in field review and were subsequently omitted from the final version, when modules were consolidated or moved to another level.

A ***strand*** is a group of modules designed to support broad career and occupational opportunities. There are 22 strands, with a total of almost 650 modules. Modules in any particular strand have similar:

- tools and technologies
- working environments and situations
- clientele
- products and processes.

CTS = 22 strands
⇓
660 modules

A ***course*** in CTS includes a selection of modules from one or more strands (or, in junior high, components of modules) consisting of only those modules that meet the defined parameters:

- prerequisites
- facility/equipment guidelines
- instructional qualifications.

Whereas in the past, courses were designed by Alberta Education, CTS courses are designed *at the school/system level* by combining modules that best suit the needs of the students, the school/school system and the community.

At the junior high school level, courses can be based on entire modules or on components of modules.

At the senior high school level, a course can be a combination of modules from one or more strands. When students successfully complete a module, they earn one credit. Courses composed of advanced level modules may be used by students to meet the high school diploma requirement of 10 credits at the 30 level.

See Section B of this manual for how to define and report courses to Alberta Education.

Key Features of CTS

Following is a summary of the key features of the CTS curriculum:

Key features of CTS:
1. Clearly defined results
2. Learning as a continuum
3. Learning in bite-sized pieces
4. Resource-centred learning
5. Connections enhanced
6. Expanded delivery strategies
7. Increased local decision making
8. Basic competencies integrated
9. Experiential/process focus
10. Technology as tool
11. Realistic career contexts.

1. *Clearly Defined Results (Learner Expectations)*

CTS modules are results based, not time based. A results-based curriculum describes, in observable terms, what students are required to know and be able to do. The CTS curriculum:

- clearly defines what students are expected to know and be able to do—that is, what competencies (knowledge, skills, attitudes) are to be developed (*curriculum standards*)
- establishes the criteria and conditions for assessing student performance (*assessment standards*).

Curriculum Standard: What a student must know and be able to do.

Assessment Standard: How a student's competency is to be judged.

2. *Learning as a Continuum—Junior to Senior High*

CTS is a results-based curriculum with no distinct boundaries between junior and senior high school. The modules defined for each strand are organized into levels (introductory, intermediate and advanced). Some modules have prerequisites, others do not.

Note: The regulations on waiver of prerequisites as outlined in the *Guide to Education: ECS to Grade 12 Handbook, 1997* do not apply to CTS courses because there is no designated junior high curriculum as there is in core and other complementary programs.

Junior high school courses will, in general, comprise introductory level modules (or components of these modules), which develop foundation competencies for each of the strands and focus on personal use applications.

Senior high school courses will build on the competencies students develop in junior high school within a particular strand, or expand students' repertoire of competencies by introducing them to other strands.

See Section B of this manual for the policy regarding recognition of prior learning and challenge in CTS.

3. *Learning in Bite-sized Pieces*

The CTS curriculum structure allows schools to design programs in which students can:

- progress at a rate that is personally challenging
- select modules and strands to develop competencies they find relevant
- build on success and investigate new options
- find immediate success or feedback.

At the senior high school level, schools must provide access to 25 hours of instruction per credit. Refer to the *Guide to Education: ECS to Grade 12 Handbook, 1997*.

Schools determine which modules/strands are available and the degree of decision making students have in program planning.

4. *Resource-centered Learning*

Teachers and students are encouraged throughout the learning process to access a wide selection of resources and other information sources available within the classroom, the school or the community. Such resource use encourages students to manage information more effectively and to take increased responsibility for their learning. By learning to identify and assess information needs and sources, students also become better decision makers and communicators.

Section I of each strand's *Guide to Standards and Implementation* is a Learning Resource Guide with annotated authorized and other resources, and a list of additional sources of information.

Resource annotations and curriculum correlations are available for all approved resources. See Section I of each strand's *Guide to Standards and Implementation*.

5. *Connections Enhanced*

The CTS curriculum structure supports curriculum linkages and integration to help students transfer learning more effectively. Potential connections within the CTS program, with other complementary and core programs, and with other levels of schooling are defined i.e., in Section H of each strand's *Guide to Standards and Implementation.*

See Section B of this manual for further information about opportunities for integration and linkages.

6. *Expanded Delivery Strategies*

CTS supports a variety of learning opportunities and delivery strategies using technologies and resources available in the school and community. CTS emphasizes the importance of community involvement, especially where community resources may supplement school resources.

See Section B of this manual for more information on delivery strategies, including establishing and maintaining effective community partnerships. Also refer to *Off-Campus Education Guide for Administrators, Counsellors and Teachers.*

7. *Increased Local Decision Making*

The CTS curriculum requires increased site-based decision making both at the classroom level and the school level. Schools/systems/teachers decide:

- which CTS strands and modules to offer to students to take maximum advantage of facilities, equipment and instructional expertise available on-campus and off-campus
- where to deliver the strands/modules will (school site, work site or combined)
- how to manage learning (the degree of choice students are given in selection of modules and rate of progress)
- how to help build connections with what students learn in CTS and other courses, such as math, science, humanities and fine arts
- which instructional and delivery strategies to use, both on-campus and off-campus.

As mentioned earlier, the CTS curriculum structure allows schools to design programs in which students can:

- progress at a rate that is personally challenging
- select modules and strands to develop competencies they find relevant
- build on success.

8. *Basic Competencies Integrated*

A set of basic competencies (or "employability skills") has been defined for the CTS program. In each module. throughout CTS, students are expected to exert degrees of effort in demonstrating the basic competencies, depending on the level of the module.

The Basic Competencies Reference Guide outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observation involving the student, teacher(s), peers and others as they complete the requirements for each module.

Basic competencies in CTS:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility.

Suggested strategies for classroom use of the Basic Competencies Reference Guide include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Have students complete an employability skills portfolio.

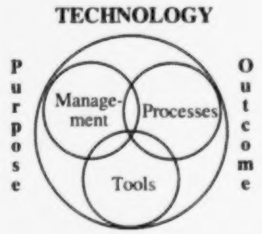
9. *Experiential/Process Focus*

CTS links theory and practice in a practical context that is meaningful to students and helps them become contributing members of society and part of a well-qualified work force. Because the basic and career-specific competencies students develop through CTS are transferable within career areas, students will be more flexible and have increased confidence so that they can adapt to a variety of situations.

10. *Technology as Tool*

In CTS, students learn by doing, applying the most appropriate technology in the most effective way. Technology involves:

- efficiently and effectively selecting and using the tools or resources that are available
- determining and applying which processes and procedures best suit the task at hand
- assessing and managing the impact technology may have on them, on others and on the environment.



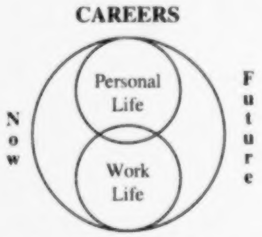
Note: Some strands, such as Design Studies, Fashion Studies, Financial Management, and Management & Marketing, include modules that **require** access to computers and specified software.

In CTS, students ***learn about computers*** in strands such as Information Processing and Electro-Technologies, and ***learn with computers*** in all strands.

Technology continues to change and students, schools and society must be prepared to adjust and take advantage of new opportunities for learning and program delivery.

11. *Realistic Career Contexts*

The concept of "career" is integral to the CTS program. A career not only relates to a person's job or occupation, but also involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen.



Career: the sum total of life's experiences
Occupation: a cluster of similar jobs
Job: a position of work in an organization.

CTS offers students learning opportunities in a wide range of career contexts.

See Appendix 7, "Career Planning in CTS," for more information about occupations and which strands provide a good foundation for workplace transition.

Each of these contexts can help open doors to many occupational, employment and vocational opportunities that can enrich the students' opportunities within their family, community and the world throughout their life span.

With practical, career-related experiences, students can make more effective career decisions and better target their learning efforts.

How does CTS Differ from the Former Practical Arts?

For the last 25 years or so, the Alberta practical arts programs have been popular and successful. In 1991–92, over 130,000 practical arts course completions were reported, nearly 80,000 of which were in business education, over 17,000 in home economics and over 37,000 in industrial/vocational education.

CTS *retains the strengths* of the former practical arts programs. As well, CTS supports and encourages a transition towards more student-centred program planning and alternative delivery strategies.

Key changes from practical arts to CTS include:

- retaining and consolidating related learnings from the practical arts programs
- introducing new concepts and building competencies that support a wider range of career opportunities and applications of technology
- integrating basic competencies and assigning these competencies greater importance in the learning and assessment processes
- promoting connections with other curriculum.

Chart A-3 lists the practical arts courses that were replaced by CTS and indicates the degree of curriculum change. In the table, **Minor Change** indicates that many concepts from related practical arts courses are retained but may be consolidated. There may be a shift in emphasis to process from task/tools and revised learning sequences, new resources, etc. **Major Change** means that there has been a significant addition of new learnings, processes and technologies.

As well, Section H of each strand's *Guide to Standards and Implementation* includes charts that identify which practical arts concepts continue to be taught in CTS and in which modules.

Practical arts programs encompassed home economics, business education, industrial education and vocational education (see Chart A-3).

CTS both consolidates and adds to the learnings of the practical arts programs it replaces; i.e., the 1200 credits available in about 300 courses in practical arts have been reduced to less than 650 credits in CTS.

Charts in Section H of each strand's *Guide to Standards and Implementation* correlate the related practical arts to the CTS modules.

Chart A-3: Practical Arts Courses Replaced by CTS Strands

Strand	Former Practical Arts Courses Affected by CTS	New Strand	Minor Change *	Major Change **
Agriculture	Agriculture: Land and Life 7-8-9 Agriculture 10–20–30 Horticulture 12–22–32			▨
Career Transitions	no related practical arts course			
Communication Technology	Industrial Education 7–8–9 (Visual Communication) Graphic Arts 22–32 Industrial Education 10–20–30 (Visual Communication) Visual Communication 12–22–32			▨
Community Health	Home Economics 7–8–9 (Family) Health Sciences 12–22–32 Personal Living Skills 10–20–30			
Construction Technologies	Industrial Education 7–8–9 (Materials) Building Construction 12–22–32 Electricity 12–22–32 Industrial Education 10–20–30 (Materials) Industrial Education 10–20–30 (Electricity/Electronics)		▨	
Cosmetology	Beauty Culture 12–22–32		▨	
Design Studies	Drafting 10–20 Drafting 12–22–32			▨
Electro-Technologies	Electronics 12–22–32 Industrial Education 10–20–30 (Electricity/Electronics)			▨
Energy & Mines	no related practical arts course	▨		
Enterprise & Innovation	no related practical arts course	▨		
Fabrication Studies	Industrial Education 7–8–9 (Materials) Industrial Education 10–20–30 (Materials) Machine Shop 12–22–32 Piping 12–22–32 Sheet Metal 12–22–32 Welding 12–22–32			▨
Fashion Studies	Home Economics 7–8–9 (Clothing) Clothing and Textiles 10–20–30			▨
Financial Management	Recordkeeping 10 Business Calculations 20 (Components) Accounting 10–20–30		▨	

*** Minor Change:** Many concepts from related practical arts courses are retained, but may be consolidated. There may be a shift in emphasis to process from task/tools and revised learning sequences, new resources, etc.

**** Major Change:** Significant addition of new learnings, processes and technologies.

Chart 3-A: Practical Arts Courses Replaced by CTS Strands (continued)

Strand	Practical Arts Courses Affected by CTS	New Strand	Minor Change *	Major Change **
Foods	Home Economics 7–8–9 (Foods) Food Preparation 12–22–32 Food Studies 10–20–30		▨	
Forestry	no related practical arts course	▨		
Information Processing	Computer Studies 7–8–9 Business Calculations 20 (Components) Business Communications 20 (Components) Computer Literacy 10 Computer Processing 10–20–30 Dicta Typing 20 Shorthand 20-30 Typewriting 9 Typewriting 10–20–30 Word Processing			▨
Legal Studies	Law 20-30		▨	
Logistics	no related practical arts course	▨		
Management & Marketing	Business Studies 9 Basic Business 20–30 Marketing 20–30 Office Procedures 20–30 (Components) Business Communications 20 (Components) Dicta Typing 20 Business Calculations 20 (Components)			▨
Mechanics	Industrial Education 7–8–9 (Power) Mechanics 12 Automotives 22–32 Related Mechanics 22–32 Autobody 12–22–32 Industrial Education 10–20–30 (Power Technology) Driver and Traffic Safety Education 10			▨
Tourism Studies	no related practical arts course	▨		
Wildlife	no related practical arts course	▨		

*** Minor Change:** Many concepts from related practical arts courses are retained, but may be consolidated. There may be a shift in emphasis to process from task/tools and revised learning sequences, new resources, etc.

**** Major Change:** Significant addition of new learnings, processes and technologies.

What Resources Support the CTS Curriculum?

CTS curriculum implementation is supported by a set of curriculum documents and other materials.

Curriculum Documents

Chart A-4 lists the curriculum documents that support the CTS program. **Note**: Many of these documents are available in both print and electronic formats.

The most recent version of the *Guides to Standards and Implementation* for strands available for optional implementation can be reviewed on the Internet:

URL: http://ednet.edc.gov.ab.ca
Click on "Students & Learning," then "Student Programs"

Warning: Check memory capacity on your computer before downloading CTS documents.

Chart A-4: Overview of CTS Curriculum and Support Resources

Document	Contents
Program of Studies Source: Print: LRDC Internet: http://ednet.edc.gov.ab.ca Status: Legal Document	A. Program Rationale and Philosophy B. Strand • Rational and Philosophy • Scope & Sequence • Curriculum and Assessment Standards
Guide to Standards and Implementation (22 strands) Source: Print: LRDC CD ROM: LRDC Internet: http://ednet.edc.gov.ab.ca Status: Support Document	Each GSI comprises the following sections: A. CTS Program of Study B. Strand Rationale C. Planning for Instruction D. Introductory Level Module Curriculum and Assessment Standards E. Intermediate Level Module Curriculum and Assessment Standards F. Advanced Level Module Curriculum and Assessment Standards G. Assessment Tools H. Linkages I. Learning Resource Guide J. Sample Student Learning Guides K. Acknowledegments.
CTS Tracker Source: LRDC Present Version: 3.2 (August 1997) Status: Administrative Tool	Database software program and manual that helps teachers track students taking CTS. Allows schools to print class lists, report cards and module and program profiles.

Support Documents

This *CTS Manual for Administrators, Counsellors and Teachers* includes the appendices listed below in Chart A-5 that may be useful for program implementation and maintenance.

Chart A-5: Appendices to *CTS Manual for Administrators, Counsellors and Teachers*

Document	Contents
Scope and Sequence Charts and Module Descriptions Appendix 1 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Provides scope and sequence charts for all strands plus brief descriptions of each module. These charts identify each module and module number and show prerequisites and recommended sequences.
Tracking and Reporting Student Achievement in CTS Appendix 2 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Describes reporting procedures for CTS modules/courses, and provides a list of codes for CTS strands. In addition, suggestions for tracking CTS modules are presented.
CTS in Junior High Appendix 3 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Provides administrators, counsellors and teachers with suggestions for strand and module selection for students at the junior high level.
Making Connections in CTS Appendix 4 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Identifies potential linkages among the CTS strands and with core and other complementary programs. Includes examples of integrated projects schools are using, both within CTS and with other core and complementary subject areas.
Strategies for Implementing CTS Appendix 5 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Provides suggestions for school and school system administrators to implement CTS by outlining processes such as establishing a planning team, action plans, resource inventories and undertaking a needs assessment.
CTS Module Parameters Appendix 6 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Outlines guidelines for module delivery, including: • facilities and equipment • instructional qualifications • safety recommendations.
Career Planning in CTS Appendix 7 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Summarizes strategies and information to help teachers and school counsellors understand how CTS helps students make career decisions and workplace/post-secondary transitions.
IOP - CTS Connections Appendix 8 Source: LRDC: Print, Electronic (Word 6.0 for Windows) Internet: http://ednet.edc.gov.ab.ca	Identifies how the two programs compare and provides administrators, counsellors and teachers with suggestions for: • helping IOP students make the transition into CTS strands/modules • delivering IOP and CTS curriculum in the same classroom.
Strategies for Instruction in CTS Appendix 9 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Describes a variety of instructional strategies that support experiential learning that teachers may wish to incorporate as they implement CTS.

Chart A-5: Appendices to *CTS Manual for Administrators, Counsellors and Teachers* (continued)

Document	Contents
Developing Facilities to Support CTS Appendix 10 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Outlines suggestions and strategies to consider in the development or enhancement of facilities to support CTS.
CTS Student Learning Guide Directory Appendix 11 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Outlines guidelines for use and preparation of Student Learning Guides. Identifies groups and individuals who are willing to exchange/sell Student Learning Guides. Lists the distance learning modules that are available and projected.
Assessing Student Achievement in CTS Appendix 12 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Outlines the rationale and strategies for how student performance is to be assessed both for strand-specific and basic competencies. Provides samples of assessment tools from the various strands, as well as tools generic to all strands.
Standard Health and Safety Practices for CTS Appendix 13 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Outlines how health and safety is addressed in the CTS curriculum and provides suggestions for managing health and safety in the CTS learning environment.
Credentialling Opportunities in CTS Appendix 14 Source: LRDC: Print, Electronic (Word for Windows 6.0) Internet: http://ednet.edc.gov.ab.ca	Identifies potential credentials available through various professional associations and government agencies, which students can obtain in conjunction with CTS modules.

Background and planning documents have guided the development and validation of the CTS curriculum and may be useful in setting goals and providing a perspective for implementation plans. These documents are described in Chart A-6.

Chart A-6: Background and Planning Documents

Documents	Contents
Trends and Issues Affecting Practical Arts in Alberta Secondary Schools Source: CTS Unit Present Version: May 1989	As part of the Practical Arts Review, this document summarized the trends and issues that affected the practical arts programs in Alberta secondary schools.
A Status Report on the Practical Arts Programs in Secondary Schools in Alberta Source: CTS Unit Present Version: June 1989	As part of the Practical Arts Review, this document described the practical arts programs in Alberta secondary schools, including learning environments, enrollment patterns, delivery systems and local school system initiatives.
Proposed Directions for Change for Practical Arts Programs in Secondary Schools in Alberta Source: CTS Unit Present Version: November 1990	As part of the Practical Arts Review, this document outlined the directions for change proposed for the practical arts programs in Alberta's secondary schools. The document served as a framework for discussion and review by the various stakeholder groups. Subsequent to this input, the curriculum structure and project plan for Career and Technology Studies was established and forwarded for approval.

The following materials are available to help describe the Career and Technology Studies program and promote it in schools and communities.

Chart A-7: Communication Materials

Documents	Contents
Information Update Source: Print: CTS Unit Internet:: http://ednet.edc.gov.ab.ca	Newsletter published two or three times per year and distributed to members of CTS Communication Network. Provides information on curriculum development, opportunities for students and professional development and showcases successful practices/initiatives.
Display Materials (available for loan) Source: CTS Unit	• Variety of large pictures showing students in CTS-related poses • Laminated CTS "arrow" posters • Banner (four feet one inch wide by five feet ten inches long).
Videos Source: Copy sent to each Superintendent of Schools; additional copies available from ACCESS: The Education Station.	• *U-Choose* (1993, 11 minutes), describes CTS to students. • *Opportunities for You* (1996, 15 minutes) encourages students to consider technical careers. This video profiles CTS along with related programs/initiatives. A print "questionnaire" to assist students in career planning is included. • *CTS: Building for the Future* (1996) explains the CTS program to adults and includes a brochure describing key features of the program.
Workshop Materials Source: CTS Unit	Visuals (blackline masters for overheads, slide masters on "PowerPoint") and print materials in a variety of topics, including: • Tracking and Reporting Student Achievement in CTS • Assessing Student Achievement in CTS.

B. CTS in Schools

Implementing CTS B–1
Student Career Planning B–9
Scheduling/Delivery Strategies B–18
Learning Environments B–22
Making Connections in CTS B–23
CTS in Junior High School B–28
CTS in Senior High School B–31

This section of the manual contains information and suggestions that will assist schools to implement the Career and Technology Studies (CTS) program.

Implementing CTS

As of September 1997, all practical arts courses will have been replaced by CTS.

CTS offers more up-to-date curriculum and learning resources than was available in the former practical arts curriculum, revisions to which date from 10 to 18 years ago. CTS can be used by schools and teachers to design the courses they need to help make individual student's learning as relevant and credible as possible.

Most secondary schools have begun the process of making the transition from the practical arts programs to CTS. In fact, for years teachers and schools have been implementing many features of CTS to meet student needs and to retain or increase enrollments.

In some schools, the transition to CTS has been initiated through the enthusiasm of a teacher or department. In other schools, the change to CTS is primarily a result of the encouragement and coordination of school/school administration.

Suggested steps/strategies to making the Transition to CTS:

1. Prepare an implementation plan
2. Build an understanding of the CTS program
3. Select strands/modules
4. Identify appropriate learning environments
5. Select teachers to deliver the CTS program
6. Select learning and teaching resources

When making the transition to CTS, consider some or all of the following:

- modify course structures to allow for more student choice and decision making
- offer selected modules from new strands/modules
- modify timetables and schedules to increase ALL students' access to the strands/modules.

No matter how the initial change got underway, effective, ongoing change has been the result of a coordinated effort from teachers, counsellors and school/school system administrators. Following is a process that should lead to effective implementation of CTS at the school level.

When planning to implement CTS, consider:

- rate of change
- scope of change.

1. *Prepare an Implementation Plan*

A well-coordinated implementation plan makes the most effective use of everyone's time, effort and available finances. Review the suggested steps outlined below for preparing an effective implementation plan:

- establish a planning team
- draft a plan of action
- inventory your resources
- do market research about the needs, resources and wishes of your community
- identify strands/modules that can be offered
- identify potential barriers/possible solutions
- gain commitment for action/approvals
- check on your progress.

See Appendix 5, "Strategies for Implementing CTS":

- Sample Implementation Plan
- Roles and Responsibilities of Key Players
- Measures of a Successful CTS Program
- Form for Profiling Your School
- Interest Inventories
  - Staff
  - Student
  - Parent.

2. *Build an Understanding of the CTS Program*

Students, parents, community partners and other colleagues in the educational community need to understand the goals of the CTS program and how CTS differs from other curricula. School systems and schools are encouraged to design a communication plan and put together an information package that can be modified to describe CTS to the various key groups. As well, it is important to keep up to date with curriculum changes and initiatives undertaken in other communities.

The communication plan should include not only an initial orientation to CTS, but ongoing strategies to reinforce and expand understanding of the CTS program and how it is working and evolving in the school/community.

Share ideas on the CTS Web Board. It can be acessed through the CTS Home Page, found on Alberta Education's website (HTTP://ednet.edc.gov.ca).

To accomplish this task, schools/school systems can access some of the materials available from Alberta Education, other government departments and other school systems.

Refer to Section A, Chart A-7 of this manual for a list of resources available to help build an understanding of the CTS program.

3. *Select Strands/Modules*

No one school will deliver all of the strands in CTS or perhaps all of the modules in a strand. Schools will select which strands and modules to offer on the basis of student needs and available on-campus and off-campus resources.

Principals should ensure that the module parameters for a module have been met. These module parameters are outlined in the curriculum and assessment standards sections (D, E, and F) at the top of each module in each strand's *Guide to Standards and Implementation* and in Appendix 6, "CTS Module Parameters."

4. *Identify Appropriate Learning Environments*

CTS encourages schools to use both on-campus and off-campus learning environments and a wide variety of delivery strategies.

On-campus (School-site) Delivery: When large numbers of students are involved, it is usually more efficient and cost-effective to deliver those CTS modules on campus.

On-campus delivery strategies vary, depending on the strands/modules selected, preferred instructional strategies and number of students accessing the program. Staffing, selection of facilities and learning and teaching resources, and timetables will need to be adjusted based on how learning is to take place.

Some CTS modules entail specialized facilities and additional professional qualifications. In these situations, for example, students may be placed in industry/business for a work study component. These limitations to the delivery of the module are described at the beginning of each module in Sections D, E and F of each *Guide to Standards and Implementation.*

Many CTS modules can be offered in school facilities that were used for the practical arts programs, or in regular classrooms.

Physical resources within a school can be expanded through:

- innovative use of present equipment/facilities
- modification/expansion of present facilities
- access to equipment/facilities in the community
- access to equipment/facilities in neighbouring schools/school systems
- use of distance learning technologies and other alternative delivery strategies.

Note: All strands benefit from access to up-to-date computer workstations.

Appendix 6, "CTS Module Parameters," summarizes guidelines for module delivery:

- equipment
- professional qualifications
- safety considerations.

Chart B-1 summarizes facility and equipment needs to implement the strands and modules.

Chart B-1: Summary of Facility/Equipment Needs to Implement CTS

Strand	Facility/Equipment Needs (On- or Off-Campus)		
Level	**Intro**	**Inter**	**Adv**
Agriculture	*#	*#	*#
Career Transitions	*	*	*
Communication Technology	*	**	**
Community Health	*	*#	*#
Construction Technologies	*	*	**
Cosmetology	*	*	*
Design Studies	*	**	**
Electro-Technologies	*	**	**
Energy & Mines	* #	* #	* #
Enterprise & Innovation	*	*	*
Fabrication Studies	*	**	**
Fashion Studies	*	**	**
Financial Management	*	*	*
Foods	*	*	**
Forestry	* #	* #	* #
Information Processing	*	**	**
Legal Studies	*	*	*
Logistics	*	*	*
Management & Marketing	*	*	*
Mechanics	*	*	**
Tourism Studies	*	*	*
Wildlife	*#	*#	*#

Facility/Equipment Needs (see Appendix 6 "CTS Module Parameters")

*	Implementation supported by present facilities/equipment
**	Upgrades to equipment necessary for selected modules
***	Upgrades to equipment necessary for a majority of modules
#	Access to science or industrial education facilities/resources would be beneficial.

Chart B-2 identifies strands/modules that do not require any specialized facilities and equipment and can be offered in standard classrooms.

Chart B-2: CTS Without Labs

STRAND	Introductory Level	Intermediate Level	Advanced Level
Agriculture	AGR1010 AGR1020 AGR1060 AGR1090 AGR1110	AGR2050 AGR2090	AGR3010 AGR3020 AGR3050 AGR3090 AGR3110 AGR3130
Career Transitions	CTR1010 CTR1020 CTR1110 CTR1120 CTR1210	CTR2010 CTR2020 CTR2030 CTR2110 CTR2120 CTR2130 CTR2140 CTR2150 CTR2210	CTR3010 CTR3020 CTR3030 CTR3110 CTR3120 CTR3130 CTR3140 CTR3150 CTR3210
Community Health	CMH1010 CMH1040 CMH1050 CMH1060	CMH2010 CMH2020 CMH2030 CMH2050 CMH2070 CMH2080 CMH2090 CMH2100 CMH2110 CMH2120 CMH2130	CMH3010 CMH3020 CMH3030 CMH3040 CMH3050 CMH3070 CMH3080 CMH3090 CMH3100 CMH3120 CMH3130 CMH3140
Construction Technologies		CON2190	CON3080 CON3100 CON3110
Design Studies		DES2060	DES3170 DES 3180
Electro-Technologies	ELT1050	ELT2050 ELT2060 ELT2070 ELT2080	ELT3100 ELT3110
Energy & Mines	ENM1010 ENM1080 ENM1100	ENM2010 ENM2080 ENM2100	ENM3010 ENM3050 ENM3080 ENM3100
Enterprise & Innovation	ENT1010 ENT1020	ENT2010 ENT2020 ENT2030 ENT2040	ENT3010 ENT3020
Fabrication Studies		FAB2020	
Fashion Studies	FAS1070	FAS2010 FAS2020 FAS2040 FAS2140	FAS3010 FAS3070 FAS3140
Financial Management	FIN1010 FIN1020 FIN1030	FIN2010 FIN2020 FIN2030 FIN2050	FIN 3010 FIN3020 FIN3030 FIN3040 FIN3050 FIN3060 FIN3070
Forestry	FOR1010 FOR1020 FOR1100	FOR2010 FOR2030 FOR2070 FOR2100 FOR2120	FOR3010 FOR3060 FOR3070 FOR3080 FOR3120

Chart B-2: CTS Without Labs (continued)

STRAND	Introductory Level	Intermediate Level	Advanced Level
Logistics	LOG1010		
Management & Marketing	MAM1010 MAM1020 MAM1030	MAM2010 MAM2020 MAM2030 MAM2040 MAM2060 MAM2080	MAM3010 MAM3020 MAM3030 MAM3040 MAM3050 MAM3060 MAM3080
Mechanics			MEC3010 MEC3080
Tourism Studies	TOU1010 TOU1020 TOU1030 TOU1040 TOU1050 TOU1060 TOU1070	TOU2010 TOU2050 TOU2060 TOU2070 TOU2080 TOU2090 TOU2100	TOU3030 TOU3040 TOU3050 TOU3060 TOU3080 TOU3090 TOU3100 TOU3110
Wildlife	WLD1010 WLD1020 WLD1050	WLD2020 WLD2040 WLD2060 WLD2090	WLD3020 WLD3050 WLD3060 WLD3090

Off-campus (Work-site) Delivery: For individual or smaller groups of students off-campus learning environments can offer excellent opportunities for learning—particularly in strands/modules that involve rapidly changing technologies and processes that are not available in the school.

Refer to *Off-Campus Education Guide* for guidelines for work–study learning experiences.

Work-site contacts and work experience/off-campus coordinators should base the off-campus learning experience on the curriculum and assessment standards established for one or more modules. If the student successfully completes the module credit should be given in the respective strand/module. Students enrolled in modules/courses involving off-campus learning experiences should be registered through the work study component of the Off-Campus Education program.

Combined School–Work-site Delivery: Schools might find that a particular work site is only willing or able to address part of the module learner expectations for one or more modules. In this case, schools will need to ensure students have the opportunity to develop and demonstrate the remaining competencies so that they can complete the modules.

5. *Select Teachers to Deliver the Program*

The key factor in the effective delivery of the CTS program is the involvement of qualified enthusiastic teachers. Human resources can be expanded through:

- effective orientation and inservice of practical arts and other teachers on staff
- partnerships with experts from the community who work with a teacher to deliver one or more modules either on-campus or off-campus
- increased involvement of teachers from other subject specialties such as:
  - science teachers delivering modules from the Forestry or Electro-Technologies strands
  - art teachers and visual communications teachers cooperatively delivering modules from the Design Studies strand
  - elementary teachers who combine their skills in integrating learning with strand-specific skills.
- partnerships with post-secondary institutions.

Chart B-3 provides a summary of professional development needs for each strand based on the degree of scope of change. The chart assumes a qualified practical arts teacher is making the transition into CTS. Within this framework the A B and C notations indicate a need to:

A = Build awareness of new curriculum and resources
B = A plus some development/expansion of specialized/technical competencies and delivery strategies.
C = A plus considerable development/expansion of specialized/technical skills and delivery strategies.

Professional development needs can be grouped into three stages:

1. building awareness of new curriculum and resources
2. development/modification of technical skills
3. development/modification of delivery strategies.

See Appendix 6 "CTS Module Parameters" for information on which CTS modules specify recommended qualifications in addition to a teaching certificate.

Chart B-3: Summary of Professional Development Needs to Implement CTS

Strand	Module Level		
	Intro	Inter	Adv
Agriculture	A	B	B
Career Transitions	A	A	A
Communication Technology	A	B	B
Community Health	A	B	B
Construction Technologies	A	A	B
Cosmetology	A	B	B
Design Studies	A	B	B
Electro-Technologies	A	B	C
Energy & Mines	A	B	C
Enterprise & Innovation	A	B	B
Fabrication Studies	A	B	C
Fashion Studies	A	B	B
Financial Management	A	A	B
Foods	A	B	B
Forestry	A	B	C
Information Processing	A	B	C
Legal Studies	A	A	A
Logistics	A	A	A
Management & Marketing	A	A	A
Mechanics	A	B	C
Tourism Studies	A	B	B
Wildlife	A	B	B

A = Build awareness of new curriculum and resources.
B = A plus some development/expansion of specialized/technical competencies and delivery strategies.
C = A plus considerable development/expansion of specialized/technical skills and delivery strategies.

6. *Select Learning and Teaching Resources*

Approved Learning Resources: Approved learning and teaching resources for CTS are described in Section I of each *Guide to Standards and Implementation.* This section:

- provides an annotation for each resource
- indicates if the approved resources are considered appropriate for junior and/or senior high school students
- indicates where the resource can be obtained

Authorized resources fit into the following categories:

- **Basic:** resource supports three or more modules
- **Support:** resource supplements a "basic" resource or supports one or two modules
- **Teaching:** resource supplements a "basic" resource or is more appropriate for teacher reference.

- correlates the resource to the module(s) it supports and includes a chart that correlates the resource to the modules
- identifies other resource contacts that may be available from community or professional associations or government departments and agencies.

Student Learning Guides: Section J of every *Guide to Standards and Implementation* (except Logistics) includes two or three sample Student Learning Guides (SLGs). Some of these sample SLGs have targeted junior or senior high school students.

Refer to Appendix 11 "CTS Student Learning Guide Directory" for suggestions for developing student learning guides and a directory of learning guides that are available for exchange or purchase.

Student Career Planning

All secondary students can benefit from taking CTS. A well-designed student program plan can encourage students to identify one or more "fall-back" plans should their preferred career goal not work out. CTS program planning should begin in junior high school so that students can plan for and develop their competencies for:

- daily living/personal interest
- career planning and decision making
- career preparation building competencies that lead to workplace entry or entry into a related post-secondary program.

Students over the six or seven years of their junior and senior high school programs should plan to complete:

- 10–15 CTS modules to build daily living skills
  30–40 CTS modules for transition to the workplace or specific post-secondary programs.
- 20–45 CTS modules to prepare for direct entry into a specific occupation or apprenticeship program.

Daily Living/Personal Interest

CTS includes competencies that many people consider "basic" for daily living for students as they move into adult roles and live independently. These competencies include financial management, nutrition and basic meal preparation consumer decision making and using information technologies. Although some students develop these competencies in the home environment many do not.

Note: A competency developed as a personal interest during secondary school can often form the foundation for a career choice now or in the future. For example students learning about entrepreneurship might not immediately start their own business but they might be more willing to do so in the future.

In addition many students may wish to access modules that help them develop and enhance their personal interests. For example many modules help build skills that students can use for recreation and as hobbies.

CTS provides a more specialized focus to learnings developed in Health and Personal Development 7 8 and 9 and Career and Life Management 20.

Students with special needs enrolled in CTS courses might require differentiated instruction within each CTS strand depending on the student's learning or behavioural circumstances. Varying the instructional time, learning environment resources, materials, presentation, assignments and assessments to accommodate such students should be based on curriculum and assessment standards included within each CTS module. The differentiated instruction and modification of assessment standards used to determine student performance and progress should be described in the student's individualized program plan.

Chart B-4 identifies modules that provide a strong introduction to each strand. These modules can support daily living and personal use competencies, and form a solid foundation for further study. Schools/school systems should review and adjust this list to reflect local interests and resources.

Chart B-4: CTS Modules that Support Daily Living/Personal Use Competencies

Strand	Modules
Agriculture	AGR1010: Agriculture: Getting the Big Picture AGR1030: Production Basics or AGR1060: Consumer Products and Services AGR1110: Resource Management and Conservation
Career Transitions	CTR1010: Job Preparation CTR1020: Leading by Example CTR1210: Personal Safety Management
Communication Technology	COM1020: Media and You COM1030: Basic Photography COM1060: Basic Audio/Video Production
Community Health	CMH1010: Family Dynamics CMH1080: Perspectives on Health
Construction Technologies	CFS1010: Introduction to Construction and Fabrication CON1120: Project Planning and Management CON1130: Solid Stock Construction
Cosmetology Studies	COS1010: Personal Images COS1060: Introductory Hair and Scalp Care COS1070: Introductory Manicuring
Design Studies	DES1010: Sketching Drawing and Modelling Fundamentals DES1020: The Design Process DES1060: Drafting for Design Fundamentals

Chart B-4: CTS Modules that Support Daily Living/Personal Use Competencies (continued)

Strand	Modules
Electro-Technologies	ELE1010: Electro-Assembly I ELE1030: Electrical Generation and Distribution ELE2030: Branch Circuit Wiring
	ENM1010: Overview of Alberta Geology ENM1020: Non-renewable Resources or ENM1050: Renewable Resources ENM1100: The Conservation Challenge
Enterprise & Innovation	ENT1010: Challenge and Opportunity ENT1020: Planning A Venture ENT2040: Making It Happen
Fabrication Studies	CFS1010: Introduction to Construction and Fabrication FAB1100: Fabrication Principles FAB1130: Principles of Machining
Fashion Studies	FAS1030: Ready Set Sew! FAS1040: Fun with Fashion FAS2080: Activewear
Financial Management	FIN1010: Introduction to Financial Management FIN1020: Establishing an Accounting System for a Service Business FIN1030: Completing the Accounting Cycle for a Service Business
Foods	FOD1010: Food Basics FOD1020: Baking Basics FOD2010: Beyond Canada's Food Guide
Forestry	FOR1010: Why Forestry FOR1020: Forest Regions of Canada FOR1100: Forests Forever I
Information Processing	INF1010: Computer Operations INF1030: Word Processing I INF1060: Spreadsheet I
Legal Studies	LGS1010: You and the Law I: As a Consumer and as a Family Member LGS1020: You and the Law II: In Society and in the Workplace LGS2010: Family Law
Logistics	LOG1010: Introduction to Logistics
Management & Marketing	MAM1010: Management and Marketing Basics MAM2010: Managing for Quality MAM2020: Promotion: Advertising
Mechanics	MEC1020: Vehicle Service and Care MEC1040: Engine Fundamentals MEC1090: Electrical Fundamentals
Tourism Studies	TOU1010: The Tourism Industry TOU1020: People and Places TOU1030: Quality Guest Service

Chart B-4: CTS Modules that Support Daily Living/Personal Use Competencies (continued)

Strand	Modules
Wildlife	WLD1010: What is Wildlife? WLD1020: Natural History of Alberta Wildlife WLD1050: Our Wildlife - Our Responsibility

Career Planning and Preparation

CTS is designed to help students "screen in" and "screen out" career areas that they wish to pursue that interest them and that help them develop competencies that can lead to success—an effective investment of their time and energies *and* society's resources.

The CTS program is based on a belief that:

- students are more likely to be motivated and to succeed when they are learning in a context that they find relevant to their life goals and that is based on "real-life" experiences
- as students complete modules they will build confidence and be more willing to learn in wider contexts and more able to make connections between what they learn in school and the challenges of the "real world."

As students move through introductory to advanced level modules and the technologies and processes dealt with in the various strands they will better understand that the career plan they have today will need to change and evolve over time.

It is important that students recognize that the competencies (or "skill sets") they develop now can be applied in different career contexts both now and in the future.

CTS teachers and school counsellors need to work together to help students understand the career options and the steps they will need to take to meet the entry-level requirements of their career choices.

See Appendix 7 " Career Planning in CTS" for more information on:

- occupations related to CTS strands
- credentialling opportunities
- related post-secondary programs.

Transitions to the Workplace

Students who complete intermediate and advanced level modules in one or more CTS strands will have developed competencies expected and recognized by the workplace.

All students—university- college- or workplace-bound—will benefit from CTS.

Chart B-5 identifies the number of occupations related to what students learn in the various CTS strands. The selection of these occupations was based on a review of the information included in the National Occupational Descriptions published by Employment and Immigration Canada. A particular occupation may require:

- (D) a high school education
- (C) further training as an apprentice for a trade
- (B) a certificate or degree from a college or technical institute
- (A) one or more degrees from a university.

Note: The occupational linkages charts in Appendix 7 "Career Planning in CTS" are also included in Section H of each strand's *Guide to Standards and Implementation*.

Chart B-5: Occupational Linkages—Number of Occupations Related to CTS Strands Listed in the National Occupational Charts (NOC)

Strand	D	C	B	A
Agriculture	24	2	29	28
Career Transitions				
Communication Technology	4	3	13	7
Community Health	14	--	24	30
Construction Technologies	9	19	5	1
Cosmetology Studies	2	1	2	--
Design Studies	--	--	4	7
Electro-Technologies	5	10	13	2
Energy & Mines	34	1	19	18
Enterprise & Innovation	4	--	26	30
Fabrication Studies	12	6	2	1
Fashion Studies	27	--	12	6
Financial Management	13	--	17	15
Foods	14	2	6	4
Forestry	15	--	13	17
Information Processing	14	--	10	5
Legal Studies	5	--	8	8
Logistics	36	--	9	--
Management & Marketing	4	--	26	30
Mechanics	9	17	21	3
Tourism Studies	9	--	6	3
Wildlife	3	--	6	14

D = requires high school education
C = requires further training as apprentice for a trade
B = requires a certificate or degree from a college or technical institute
A = requires one or more degrees from a university

Credentialling Opportunities

Students who complete selected modules in CTS may qualify for complete or partial credentials which are recognized by business industry and/or post-secondary organizations. These credentials in most cases complement the competencies developed within a module(s). In some cases students must attain the credential as part of the exit-level competencies defined for a specific module.

Students who have met the standards for the related module and wish to receive the related credential might have to pay additional fees and/or undertake additional off-campus learning experiences.

These credentials are recognized in the workplace and community. All have standards and testing procedures established by the credentialling agency.

In some cases teachers might need external certification to be certified to handle the assessment. In other cases the credentialling agency must do the assessment. In many cases there are additional costs to access these credentials.

Chart B-6 provides a summary of the strands that include credentialling opportunities. Some credentials require a combination of strand-specific modules and practicum modules from Career Transitions. Appendix 14 "Credentialling Opportunities in CTS" describes these credentialling opportunities in more detail.

Note: For many of the credentials noted below the instructor requires special qualifications (noted with an asterisk [*] below.)

Chart B-6: CTS Strands Offering Credentialling Opportunities

Strand	Credentialling Opportunities
Agriculture	• Green Certificate Farm Training Program – Beef Production – Crop Production – Irrigated Crop Production – Sheep Production – Swine Production • Flowers Canada Accreditation Program – Design Skills – Retail Skills • Pesticide Certificate Programs – Farmer Pesticide Certificate – Lawn and Garden Domestic Pesticide Dispenser Course – Pesticide Applicator Certificate – Retail Pesticide Dispenser Certificate (Class I)

Chart B-6: CTS Strands Offering Credentialling Opportunities (continued)

Strand	Credentialling Opportunities
Career Transitions	• First Aid Certification: Emergency First Aid* • Workplace Hazardous Materials Information System (WHMIS) • Transportation of Dangerous Goods (TDG) • Job Safety Skills
Community Health	• Baby-sitting • Emergency Child Care* • First Aid in Child Care* • First Aid Certification – Emergency First Aid* – Standard First Aid* • Family Health Care (in revision) • Day Care (Level I) • Athletic First Aid
Construction Technologies	• Explosive Actuated Tools
Energy & Mines	• Petroleum Industry Training Programs – Petroleum Fundamentals – Hydrogen Sulphide Alive – Blowout Prevention – Floorman Training – Oilfield Maintenance • Power Engineering Technology
Foods	• Food Sanitation and Hygiene
Forestry	• Wilderness First Aid/Basic Rescue
Tourism Studies	• Tourism: ALBERTA BEST*
Wildlife	• Alberta Conservation and Hunter Education Program* • Alberta Fishing Education Program* • Alberta Tourism Industry Standards – Outdoor Guide – Freshwater Angling Guide – Hunting Guide • Canadian Firearms Safety Course • Wilderness First Aid/Basic Rescue

* Instructor might require additional qualifications or will need to work with a community partner in order to credential students.

Potential Linkages with Alberta's Apprenticeship Program

Several CTS strands can prepare students for a number of trade areas. Negotiations are underway to provide more formal articulation agreements with CTS strands and modules and the various trade areas. Chart B-7 provides a preliminary list of the apprenticeable trades that the CTS strands support.

Note: For students to receive credit for the first training period of an apprenticeship program instruction must be supervised by a journeyman and undertaken in an approved facility.

Further information regarding apprenticeship linkages can be obtained by contacting Alberta Advanced Education & Career Development, Apprenticeship & Industry Training Division.

Chart B-7: Potential Linkages with Alberta's Apprenticeship Trades

		CTS Strands												Enhancement Modules	
	Trade	Agriculture	Communication Technology	Construction Technologies	Cosmetology	Design Studies	Electro-Technologies	Energy & Mines	Fabrication Studies	Fashion Studies	Foods	Management & Marketing	Mechanics	Career Transitions	Enterprise & Innovation
High Degree of Alignment With Apprenticeable Trades	Agricultural Mechanic												■		
	Autobody Mechanic												■		
	Baker										■				
	Cabinetmaker			■											
	Carpenter			■											
	Communication Electrician						■								
	Cook										■				
	Electrician						■								
	Electronic Technician						■								
	Hairstylist				■										
	Heavy Duty Mechanic												■		
	Landscape Gardener	■													
	Machinist								■						
	Motorcycle Mechanic												■		
	Motor Mechanic												■		
	Printing & Graphic Arts Craftsman		■			■									
	Sheet Metal Worker								■						
	Tool & Die Maker								■						
	Welder								■						

CTS Strands – that deliver many of the competencies/program defined in the first period of the apprenticeship program ■
CTS Strands – that deliver some of the competencies/program defined in the first period of the apprenticeship program ▒

Registered Apprenticeship Program (RAP)

The Registered Apprenticeship Program (RAP) is designed for high school students who wish to become a trade apprentice while completing their high school diploma.

RAP connects with the CTS program as follows:

- Students interested in a particular apprenticable trade may wish to develop some of the foundation competencies for that trade through CTS through both on-campus and off-campus experiences. In that way the students have a better understanding of the working environment and expectations.
- Employers considering accepting an apprentice may wish students to work with them using CTS modules or Work Experience courses delivered off-campus in order to have a better opportunity to judge whether the student is a suitable candidate for the apprenticeship.

Features of RAP:

- all core and other requirements for a high school diploma must be completed
- students are registered in RAP 15–25–35 courses of which up to 40 credits can be applied towards a high school diploma
- students sign an agreement to indenture in a particular trade
- RAP 15–25–35 courses are taught in off-campus situations under a journeyman's supervision completing the trade curriculum and work time requirements as defined by the Apprenticeship Board.

Course codes are available for all of the 52 apprenticeship trades. Chart B-7 is a list of CTS strands that most closely align with apprenticeship trades.

Transitions to Related Post-secondary Programs

Students who complete intermediate and advanced level modules in one or more CTS strands will have developed competencies expected and recognized by a number of post-secondary institutions in Alberta. Articulation between CTS and related post-secondary programs is a key goal for the CTS project.

Note: Section H of each strand's *Guide to Standards and Implementation* identifies CTS-related post-secondary programs at Alberta universities colleges and technical institutes.

To ensure that the competencies students develop in CTS align as much as possible with what students will be expected to know and do when they enter post-secondary institutions representatives from related post-secondary programs have been involved throughout the CTS curriculum development process.

As the development and validation of the standards by which student achievement is assessed continues we anticipate that CTS will be recognized at the post-secondary institutions in the following ways:

- identified as an *entry-level requirement* in the calendar
- identified as an *entry-level preference* in the calendar or during the selection process
- selected modules will allow *advanced credit* in a related post-secondary program
- selected modules will allow *advanced standing* in a related post-secondary program.

To meet post-secondary entry requirements CTS courses identified at the "3" level are equivalent to "30-level" courses. See Appendix 2 "Tracking and Reporting Student Achievement in CTS" for further information on CTS course coding.

Schools school systems need to contact local post-secondary institutions to negotiate recognition of prior learning.

Scheduling/Delivery Strategies

This section of the manual presents some strategies that school administrators can use to expand students' opportunity to access CTS strands and modules.

See Appendix 6 "CTS Module Parameters" for more information on expanding delivery options.

Instructional strategies which often must align with the scheduling/timetabling options are described in Section C of this manual: CTS in the Classroom.

1. Time-Based Computer Systems

At present most school timetables are managed by computerized student records that are based on a defined time-course/credit relationship.

Following are some suggestions for implementing CTS using present computer-based scheduling systems.

- *Defining classes (assigning students/teachers)*: Standard procedures can continue to apply. A group of students can be assigned to one teacher one classroom/lab for one or more class periods. Teachers who plan to allow students to work at individual rates can make such arrangements directly with the students. Teachers will maintain separate workplans for each student. These workplans would specify the modules to be completed and the timelines for completion.

Scheduling and reporting involves:

- defining classes
- monitoring attendance
- reporting student achievement
  - interim
  - final.

The CTS curriculum structure:

- is competency based (not time based)
- is designed in smaller units of learning (modules)
- encourages schools/teachers to define courses (select modules)
- encourages schools/teachers to determine what degree of flexibility students will have.

- *Monitoring attendance*: Standard procedures can continue to apply. If a team of teachers is delivering an extended menu of modules to a group of students students could report to a particular teacher at the beginning of the class period for attendance purposes and then proceed to the assigned work area.
- *Reporting student achievement (interim and final)*: Adjustments will need to be made. At the beginning of the course students and parents should be informed about how the CTS courses are being delivered and how student achievement will be assessed and reported.

  During interim reporting the "comments" menu should be expanded to allow teachers to reference student progress in the modules. At final reporting if a student has completed more or fewer modules than was defined in the original course code an adjustment to the individual student record will need to be made.

Refer to Appendix 12 "Assessing Student Achievement in CTS" for additional report card "comments."

2. *Class Length*

Because CTS is an experiential program it is important that students have opportunities to **demonstrate** their competencies. If the time block for the class is too short it is very difficult to ensure students have sufficient hands-on experiences and develop skills effectively. They need time to set up work on the project and clear up.

School-site learning recommended minimum time blocks:

- 40 minutes: junior high
- 60–120 minutes: senior high.

As the students move into intermediate and advanced level modules the assignments/projects become more complex and often use a wider range of tools and supplies thus requiring more time to set up and clear away.

3. *Class Sequencing*

Many CTS modules ask students to develop a set of skills that they then apply to a variety of situations. It is particularly valuable if students can learn and practise the skill frequently particularly at the introductory levels. Consequently daily scheduling of the skill-based strands/modules is highly recommended.

4. *Timetabling Alternatives*

The CTS modular competency-based curriculum structure enables schools to implement a variety of timetabling options including:

- defining specific modules within an instructional time block (limited flexibility)
- scheduling open labs (maximum flexibility)
  - open entry/exit
  - students select from a menu of modules
- scheduling of multi-level modules/strands concurrently
  - one teacher
  - a team of teachers
- cycling strands/courses
  - over semesters/terms
  - over two or three school years
- expanding school day (evenings weekends summer)
- connecting CTS to:
  - core or other complementary courses (e.g. learning word processing within a language arts class)
  - school projects/activities (e.g. yearbook school store).

See Appendix 4 "Making Connections in CTS for ideas/projects that enhance cross-curricular connections.

The timetabling/scheduling strategies that schools can apply in implementing CTS will vary. Some strategies are more appropriate than others depending on:

- strand and modules selected
- teachers' background in the strand and teaching preferences
- available resources both in school and within the community.

5. Alternative Delivery Strategies

Student access can also be expanded through the use of delivery options outside of the school classroom or lab. These include:

- sharing facilities and equipment with other educational institutions and school systems both secondary schools and post-secondary institutions:
  - mobile labs (larger equipment/facilities)
  - mobile units (smaller equipment/resources)
- accessing business/industry facilities and technical/occupational expertise:
  - off-campus instruction
    - individual
    - small groups
  - off-campus learning enhancement
    - work study
    - field trips
    - student projects
    - job shadowing
    - mentorship
  - on-campus instruction/enrichment
    - shared "expert" support (technical/specialized speakers/mentors)
    - ongoing "consultants" (e.g. Junior Achievement)
- using electronic delivery strategies including teleconferencing computer conferencing video conferencing and pre-programmed transmission.

Work-site learning time scheduling will vary depending on:

- work-site preferences
- travel time
- school timetables.

All off-campus experiences in CTS should follow guidelines outlined in *Off-Campus Education Guide for Administrators Counsellors & Teachers*.

Work Study: It is recommended that students who complete a full CTS module off-campus should have their achievement reported in the strand/module not Work Experience 15–25–35.

Learning Environments

CTS learning environments should promote opportunities for students to be challenged to work individually and with others and to learn in a safe and supportive environment.

A well-designed and equipped learning environment will help CTS teachers address student needs and challenge students to achieve. Some characteristics of that kind of environment include:

- *attention to health and safety* both on-campus and off-campus. The learning environment (facility equipment supplies) should be well designed with appropriate attention to health (e.g. ergonomics) and safety. In addition there should be a planned consistently monitored strategy to promote safe practices and provide access to safe facilities and equipment.
- *open areas to support teacher supervision* allowing teachers to easily observe students' efforts and monitor their performance and progress.
- *proximity of learning areas* providing opportunities for team teaching access to alternative technologies etc.
- *access to resource centres* including copies of learning and teaching resources manuals related print audio visual and computer technologies. The centre could also include curriculum materials and samples of student work to better help them focus their efforts. With such resource centres students can find answers to their questions and are encouraged to become more independent learners and to move beyond the confines of the curriculum.
- *flexible work areas* supporting the experiential nature of CTS, which links theory and practice. This concept is supported in an environment where students can do hands-on projects as well as research take notes and discuss. This flexibility is promoted when furniture can be moved for individual small group and large group instruction.
- *multiple purpose learning options* allowing delivery of as many strands/modules as possible.
- *access to computer technology* including using computers for research and communication as well as learning with computers as specified within the module.

See Appendix 13 "Standard Health and Safety Practices for CTS" for:

- how safety is addressed in the CTS curriculum
- how to monitor and improve safety in CTS learning environments.

See Appendix 6 "CTS Module Parameters" for information on equipment and facilities for delivery of each module.

- *adequate and secure storage* allowing teachers ready access to student records learning materials and supplies and space for equipment that needs repair.

Making Connections in CTS

The CTS curriculum is designed to help students make connections between what they are learning in CTS and in the other courses they are taking (horizontal connections) or have taken or will take (vertical connections).

When students identify these connections and apply them they are better able to transfer their learnings and improve their ability to succeed when challenged with new learning situations.

The CTS curriculum tries to promote connections:

- within CTS strands
- with core courses
- with other complementary courses.

Why is making connections important to CTS students? Students will be better able to:

- transfer and apply concrete and abstract learning to real-life settings
- use preferred learning styles
- break down barriers of subject-specific terminology
- recognize similarities and differences in applications of the same learning among different subject areas.

These connections are outlined in more detail in Section H of each strand's *Guide to Standards and Implementation* which provides a list of the strands and modules that complement the learning in the strand.

Integrated projects also help students recognize and apply connections between CTS strands with core subjects and with other complementary subjects.

See Appendix 4 "Making Connections in CTS" for more information on these connections and for sample integrated projects.

Connections Within CTS Strands

The CTS curriculum was designed to eliminate unnecessary duplication. Consequently some competencies that complement the learning of one strand may well be "housed" in a module in another strand. For example students in Communication Technology wishing to develop their skills in layout and presentation should also complete the modules from Information Processing that develop competency in using desktop publishing software.

In some cases Section H in the *Guide to Standards and Implementation* for one strand includes a sample module from another strand with the "Teaching Notes" section expanded to show how that module can be taught in a context outside of the home strand. For example Fashion Studies includes a module from Marketing & Management to help teachers relate that module's learnings to the fashion industry.

Chart B-8 summarizes the primary and secondary linkages between strands. Teachers and administrators could use this chart to identify modules from related strands that could be included within a student's program.

Chart B-8: Linkages Within CTS Stands

CTS Strand	Primary Linkages	Secondary Linkages
Agriculture	Construction Technologies, Design Studies, Fabrication Studies, Management & Marketing, Mechanics	Communication Technology, Community Health, Electro-Technologies, Enterprise & Innovation, Energy & Mines, Financial Management, Foods, Forestry, Information Processing, Legal Studies, Wildlife
Career Transitions*	*Connects with all strands*	
Communication Technology	Design Studies, Information Processing	Fashion Studies, Legal Studies, Management & Marketing Tourism Studies
Community Health	Foods, Legal Studies	Design Studies, Fashion Studies
Construction Technologies	Design Studies, Electro-Technologies, Fabrication Studies	Agriculture
Cosmetology	Design Studies, Fashion Studies	Management & Marketing
Design Studies	Communication Technology, Cosmetology, Construction Technologies, Fabrication Studies, Fashion Studies	Information Processing, Management & Marketing
Electro-Technologies	Construction Technologies, Mechanics	
Energy & Mines	Fabrication Studies, Mechanics	Agriculture, Community Health, Electro-Technologies, Enterprise & Innovation, Forestry, Information Processing, Legal Studies, Management & Marketing, Wildlife
Enterprise & Innovation	*Connects with all strands*	
Fabrication Studies	Construction Technologies, Design Studies, Electro-Technologies	
Fashion Studies	Design Studies, Management & Marketing	
Financial Management	*Connects with all strands*	
Foods	Community Health, Design Studies, Tourism	Communication Technology

* Career Transitions strand includes project modules that can be used to enhance learnings in all of the strands.

Chart B-8: Linkages Within CTS Strands (continued)

CTS Strand	Primary Linkages	Secondary Linkages
Forestry	Community Health, Wildlife	Agriculture, Construction Technologies, Electro-Technologies, Energy & Mines, Fabrication Studies, Information Processing, Legal Studies, Management & Marketing, Mechanics, Tourism, Wildlife
Information Processing	Communication Technology, Design Studies	
Legal Studies	Community Health, Tourism Studies	
Logistics	Information Processing, Management and Marketing	All
Management & Marketing	*Connects with all strands*	
Mechanics	Fabrication Studies, Fashion Studies, Community Health, Electro-Technologies	Agriculture, Construction Technologies
Tourism Studies	Communication Technology, Design Studies, Foods, Forestry, Wildlife	Legal Studies
Wildlife	Forestry, Community Health, Tourism	Agriculture, Communication Technology, Electro-Technologies, Energy & Mines, Enterprise & Innovation, Financial Management, Foods, Information Processing, Legal Studies, Management & Marketing

Using Career Transitions "Project" Modules

The Career Transitions strand includes ten project modules that can be used to expand a student's program. Students should only use these modules when they are undertaking learning beyond or outside of the competencies outlined in the CTS modules. For example, students in Construction Technologies who are participating in building a house are developing a level of competency that is well beyond the requirements for the related modules in that strand.

Career Transitions project modules:

- two introductory level modules
- four intermediate level modules
- four advanced level modules.

CTS "project" modules directly reinforce the Conference Board of Canada's employability skills.

For each project module, the teacher and student must specify module and specific learner expectations that are discrete from those in other CTS modules. In addition, assessment criteria, resources and timelines should be defined before beginning the project modules. Project modules can only be used in conjunction with CTS strands/modules.

Using Career Transitions "Practicum" Modules

Refer to Off-Campus Policy

The Career Transitions strand includes four practicum modules at the advanced level. These modules can only be used when a student wishes to extend the competencies developed in a related CTS strand to attain a recognized credential offered by an agency external to the school.

Modules **must** be delivered off-campus and must be supervised by both a qualified teacher and an experienced professional authorized to supervise trainees for the credential.

Connections with Other Secondary Programs

A summary of the connections between CTS and other secondary programs is described in Chart B-9. These connections will be updated from time to time to accommodate periodic revisions to curricula involved.

Core Courses

Junior and senior high school mathematics, science, language arts and personal development curriculum documents have been reviewed, and connections with the CTS strands and modules have been identified. This preliminary curriculum correlation is included in Section H of each strand's *Guide to Standards and Implementation.*

Refer to Appendix 4: "Making Connections in CTS" for examples of projects that integrated CTS and core and complementary courses.

Complementary Courses

Junior and senior high school fine arts, physical education and other related complementary course curriculum documents have been reviewed and connections with the CTS strands and modules have been identified. This preliminary curriculum correlation is included in Section H of each strand's *Guide to Standards and Implementation.*

Chart B-9 summarizes the potential connection between CTS strands and junior and senior high school core and complementary programs.

Chart B-9: CTS Linkages Across the Curriculum

	Junior High							Senior High											
CTS Strands	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Agriculture	▤	▤	■	■				▤	▤	■	■	■	■		▤		▤		
Career Transitions[1]																			
Communication Technology	▤	▤					▤	▤	▤		▤						▤		
Community Health	▤	▤			■	▤		▤	▤		▤	■	▤		■	▤			
Construction Technologies	▤	▤	■	■	▤			▤	▤	■	■	▤	▤	▤	▤				
Cosmetology Studies																			
Design Studies				▤			■				▤			▤			■		
Electro-Technologies	▤		■	■			▤	▤		■	■			■	▤				
Energy & Mines	▤	▤	▤	■				▤	▤		■		■	■	▤				
Enterprise & Innovation	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Fabrication Studies	▤	▤	■	■	▤			▤	▤	■	■		▤	▤	▤				
Fashion Studies			▤	▤			▤		▤	▤							■	▤	
Financial Management	▤	▤	▤					▤		▤						▤			
Foods		▤	▤	▤	■				▤	▤	▤	▤	▤		▤	▤		▤	▤
Forestry	▤	▤	▤	■		▤		▤	▤	■	■	■			▤	▤			
Information Processing	■	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Legal Studies	▤	▤		▤				▤	▤		▤				▤				
Logistics		▤													▤			▤	▤
Management & Marketing	■	▤	▤	▤	▤			■	▤	▤	▤				▤		▤		
Mechanics	▤		■	▤				▤		▤	▤			▤					
Tourism Studies	▤	▤						▤	▤										▤
Wildlife	▤	▤	▤	■		■		▤	▤		■	■			▤	▤	▤	▤	

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts. ■

Provides some links with course content, usually through the application of related technologies and/or processes. ▤

[1] Can be linked to all subjects across the curriculum.

CTS in Junior High School

CTS is part of the junior high school complementary course selection, along with second languages, fine and performing arts, ethical studies, environmental and outdoor education, religious studies and locally developed courses.

Junior high students will take a minimum of two provincially authorized complementary courses, each for a recommended time of 75 hours per year (*Guide to Education: ECS to Grade 12 Handbook, 1997*).

Because the curriculum structure in CTS is organized into levels, not grades, the competencies students develop in junior high school can form the foundation for further development and enhancement at the high school level.

Program Planning: Breadth and Depth

Junior high schools will decide the level of breadth and depth in the CTS strands that students can access. Because few junior high students have made specific career decisions and plans, they will be better able to learn about different career areas if they can explore several of the CTS strands along with other complementary programs.

Junior high schools can design CTS courses at Grades 7, 8 and/or 9 which include:

- components of modules, and/or
- complete modules from one or more strands.

All CTS strands can be delivered at the junior high school level, although some strands have a more specialized occupational focus and may be less relevant to the junior high school student.

Introductory level modules are considered most appropriate for junior high school students as they focus on developing competencies that are useful for daily living and form a foundation for further study within the strand (see Chart B-4).

See Chart A-3 for a list of the junior high school practical arts courses that were replaced by CTS.

The *Guide to Education: ECS to Grade 12 Handbook, 1997* states that junior high school students need opportunities to:

- continue to develop basic knowledge, skills and positive attitudes, and consolidate earlier learning
- develop their individual interests, abilities and talents and, in the process, develop specific competencies explore
- a range of learning experiences and apply new learning in different circumstances
- set goals for, and make choices about, their learning and take increasing responsibility for their education and, indeed, their lives
- mature with a positive, realistic self-image, and receive affirmation and acceptance from significant adults and peers.

Appendix 3, "CTS in Junior High," outlines modules recommended as most appropriate for junior high school students.

Over a three-year junior high school program, students could access as much as 450 hours of learning time, potentially developing competencies defined for a significant number of modules.

Junior high schools may also deliver intermediate level modules, particularly in areas such as Information Processing, when students have developed competencies during their elementary programs.

When selecting modules, junior high schools should take into account the strands/modules that will be available to students as they move into high school and build their programs/courses accordingly.

See Appendix 3, "CTS in Junior High" for more information on:

- recommended module selection for junior high
- sample junior high programs
- potential strand linkages in junior high.

Promoting Smooth Transitions

A basic belief of the CTS program is that the competencies students develop should be identified and recognized and that learning should be a continuum.

Within this perspective, junior high school students who have developed the competencies defined within a module (or components of a module), or from other learning environments such as the home or the workplace, should be able to expand on or enhance those competencies as they move through their school experience.

Transitions: Elementary to Junior High School

Some students entering junior high school may already have CTS-related competencies developed in the elementary school years, particularly in keyboarding, computer hardware and software use, and tool use. Many elementary students are already comfortable with working in multi-activity and independent learning environments. Junior high schools should consult with feeder schools to determine the level of expertise students will bring to their junior high school program.

See Appendix 4, "Making Connections in CTS" for correlations to elementary programs that relate to CTS strands.

Transitions: Junior High to Senior High School

Junior and senior high school administrative and teaching personnel are encouraged to share program plans and to cooperate as much as possible to ensure students can access CTS modules that allow them to explore a number of CTS strands.

Subject to provincial and local school board policy, if a student entering high school can demonstrate all the competencies required for one or more modules, the **senior high school principal** can grant:

- a high school credit for each module, and/or
- advanced standing into the next module in a sequence. **Note**: Many modules in CTS strands are not sequenced.

Tracking and Reporting Student Achievement in Junior High School

As in all courses, student achievement in CTS will be assessed and reported to students and parents. At the junior high school level, student achievement is not reported to Alberta Education.

To assist students in making the transition to senior high school, junior high schools will need to track which modules students have completed. The CTS module codes can be used for this purpose.

See Appendix 1, "Scope and Sequence Charts and Module Descriptions," for a quick reference to the module codes.

Funding at Junior High School

Operational Funding

Operational funding at junior high school is based on a per pupil grant. For further information, refer to Alberta Education's *School Grants Manual.*

Facilities and Equipment Funding

See Alberta Education's *School Capital Funding Policies, Regulations and Guidelines Manual* for more information on procedures for applying for support funding for CTS facility and equipment.

CTS in Senior High School

CTS is part of the senior high school complementary course selection.

Commencing in 1997-98 with individual module-level reporting, only advanced-level modules (i.e., 3000 series modules) will bear 30-level credits. These credits may accumulate through advanced-level modules taken over several strands.

Schools will need to review module combinations that are offered to ensure that students have access to an adequate number of advanced-level modules to meet the 30-level credit requirements for the Alberta High School Diploma (see 1995 *Guide to Education: Senior High School Handbook*).

Over the past few years (and during the 1997-98 school year) schools have been able to "bundle" CTS modules by combining modules from the introductory, intermediate and advanced level. These "bundled" course configurations have qualified (and will continue to qualify during the 1997-98 school year) for 30-level credit if the majority of the modules in the bundle are at the advanced level.

Program Planning: Breadth and Depth

While the emphasis in junior high school is on career exploration, senior high school students, particularly those in Grades 11 and 12, should focus on intermediate- and advanced-level modules in two or more strands to prepare for entry into the workplace or related post-secondary programs.

Some students entering high school may wish to expand on the competencies they have already developed within a particular strand. Others may wish to expand their repertoire of competencies by working in other strands.

Student Registration

Beginning with the 1997-98 school year, high schools may register students on the basis of individual CTS modules being studied. Individual modules will be reported using the 7-digit alpha-numeric module code indicated on the scope and sequence for each CTS strand.

Student transcripts will list individual CTS modules successfully completed by strand, along with other information regarding completion strategy and delivery method.

Schools will likely continue to combine modules into 3-, 4-, 5- and 6-credit courses for scheduling and instructional purposes. Course names may be used at the school level that clarify learning objectives/outcomes for students and parents.

See Appendix 1, "Scope and Sequence Charts and Module Descriptions," for lists of modules, module codes and module descriptions.

During the 1997-98 school year, schools may continue to register students by "bundling" CTS modules into 3-, 4-, 5- and 6-credit courses (see Appendix 2, "Tracking and Reporting Student Achievement in CTS").

Funding at Senior High School

Operational Grants

Funding at senior high school is based on credit enrollment units (CEUs). High school courses completed by eligible students outside of regular school hours, such as Saturdays, evenings and summers, will qualify for CEU funding if instruction is provided for a minimum of 80 hours for a 5-credit course and 48 hours for a 3-credit course. See Alberta Education's *School Grants Manual* for more information.

At the high school level, one module equals one credit.

Refer to Appendix 2, "Tracking and Reporting Student Achievement in CTS" for more information on funding for:

- completed modules
- incomplete (failed) modules
- challenged modules.

Facilities and Equipment Funding

See Alberta Education's *School Capital Funding Policies, Regulations and Guidelines Manual* for more information on procedures for applying for support funding for CTS facility and equipment.

Contact Alberta Education, School Finance and Facilities Branch, for more information on Building Quality Restoration Programs.

Refer to Appendix 6, "CTS Module Parameters," and Appendix 10, "Developing Facilities to Support CTS," if your school is planning new facilities or planning to modernize present facilities.

Tracking and Reporting Student Achievement in Senior High School

Reporting Student Achievement at the Module Level

As in all senior high school courses, student achievement in CTS is assessed and reported to students and parents and to Alberta Education.

Alberta Education has inititated the design and development of a new "Course Information System". The first component of this information system, available for use during the 1997-98 school year, will provide a module tracking system for CTS that:

- collects and tracks student attempts and achievements at the one credit module level
- lists individual modules on the Transcipt and the Statement of Course Marks
- collects and tracks the module completion strategy, withdrawal reasons and deliver method.

Commencing with the January 1998 reporting period, schools may report student achievement to Alberta Education on a module basis, using the CTS module codes provided in the scope and sequence for each CTS strand.

In CTS, only modules successfully completed (50 percent or greater) are reported to Student Records and subsequently included on the student's transcript. Schools may do their reporting of student achievement either electronically or manually, using the new file formats (or forms) provided by Alberta Education.

Each student will be awarded credit for any given CTS module that is successfully completed only once.

Failed or incomplete modules are reported to School Finance for funding purposes.

During the 1997-98 school year, schools may continue to report student achievement using "bundled" modules. This can occur in two ways:

- schools submitting electronically using the old file formats may continue to bundle modules as they have during the 1996-97 school year. The previous codes assigned to the bundled modules will apply in this situation
- schools submitting electronically using the new file formats may also continue to bundle modules in 1997-98, but will need to use new bundling codes assigned by Alberta Education to the 'old' bundles.

See Appendix 2 for a list of course codes to be used with "bundled" modules and guidelines for selecting course codes.

Please note that schools reporting modules manually may not bundle modules. In this situation, individual modules must be reported using module codes and the new forms provided by Alberta Education.

Module Tracking Systems

A number of teachers and school administrators have designed tracking systems that include print formats, spreadsheets and/or databases.

Some schools give students a module profile and a program profile, which summarize all of the modules they have successfully completed. Program profiles can be used when students transfer schools, and students can incorporate the profile into a resume or portfolio when entering post-secondary studies or the workplace.

Some of these tracking systems are quite simple, and involve using a card for each student to record all completed modules. Other more complex systems, produced commercially, are also being used.

CTS Tracker is available through the Learning Resources Distributing Centre (LRDC).

Of particular note is *CTS Tracker* (Version 3.2), a Windows-based software package designed to help administrators, counsellors and teachers track CTS modules. *CTS Tracker* will:

- import student demographic data from student record systems
- indicate which courses and modules a student is taking
- print a variety of reports, including
  - –student/teacher timetables
  - –class lists
  - –midterm and final marks
  - –program and module profiles
  - –summaries of module completion.

Promoting Smooth Transitions

An important goal in the CTS program is to improve students' ability to move successfully from junior high school to senior high school, and into the workplace or to continue their learning in related post-secondary programs.

Increased communication between junior and senior high school teachers will facilitate the articulation of junior and senior high school programs.

Recognizing Prior Learning/Competency

Students should be encouraged to refine and extend the competencies they may have already developed in junior high school, at home or in the community. To do this, high schools will need to establish procedures to assess students' prior learning.

Assessment is a process whereby the student performs certain tasks and shows samples of work that demonstrate the degree to which the expected standards and outcomes for the course have been met. The student's performance and quality of work are evaluated by a certificated teacher.

Challenge is appropriate when a student or group of students have met the standards for one or more of the modules that are being offered. Challenge assessment may occur through:

- a "traditional" comprehensive examination
- teacher observation over three to four classes
- teacher evaluation of a student's portfolio or work sample
- a student's demonstration of skills through performance of set tasks.

High schools may also request that credit be granted on the basis of recommendations received from the junior high school.

See Course Challenge Policy, 2.2.2 of the *Policy, Regulations and Forms Manual*.

In CTS, "course" = "module."

Transitions: Senior High School to Related Post-secondary Programs

Many CTS students will leave high school with competencies that align with those expected in a related post-secondary program. Section H in each strand's *Guide to Standards and Implementation* includes correlations to related post-secondary programs.

A number of articulation agreements have been established with post-secondary institutions in Alberta. These agreements provide preferred entrance and/or advanced standing/credit for CTS students who have successfully completed designated modules.

A summary of articulation agreements in place that involve CTS modules is available through Alberta Education's web site at <http://ednet.edc.gov.ab.ca>. Further information regarding particular articulation agreements can be obtained by contacting the post-secondary institution and/or reviewing its respective calendar.

Some CTS strands also link with one or more of Alberta's Apprenticeship Training Programs. Students who are employed as an apprentice in one of these trade areas and have successfully completed designated CTS modules may qualify, upon the recommendation of their employer, for a portion of the in-school training component.

Further information regarding apprenticeship linkages can be obtained by contacting Alberta Advanced Education and Career Development, Apprenticeship and Industry Training Division.

Registrars of all post-secondary institutions have been informed that CTS courses comprised of advanced-level modules should be recognized as equivalent to the former 30-level practical arts courses.

Transitions: Senior High School to the Workplace

CTS is designed to help students develop the competencies they need to enter the workplace successfully.

Although some young people may find it difficult to enter the workplace, many will find entry-level positions that offer good opportunities for advancement and career growth. Others may wish to start businesses of their own, either when they leave school or later in their careers.

Occupations related to the CTS strands are listed in Section H of each strand's *Guide to Standards and Implementation.*

These occupational charts are consolidated in Appendix 7, "Career Planning in CTS".

A number of credentialling opportunities are available to CTS students through professional and community associations. Please note that in some instances, the teacher or a community partner will require additional certification to provide the instruction and/or assessment of student competency to qualify for these credentials.

See Chart B-6 for a list of credentialling opportunities and Appendix 7, "Career Planning in CTS," for more information.

C. CTS in the Classroom

Planning for Learning C–1
Instructional Strategies C–6
Assessing Student Achievement in CTS C–9
Selecting and Using Resources C–15
Professional Development C–17

This section of the manual contains information and suggestions that will help teachers implement the Career and Technology Studies program in the classroom.

Planning for Learning

As in any course, the CTS teacher will need to plan how students will learn to develop the competencies outlined in the curriculum.

Students should clearly understanding what they are expected to know and do, including the standards of performance they must meet if they are to succeed.

Planning for learning involves the following steps:

1. review appropriate curriculum documents
2. select the strands/modules
3. decide on how and where learning will occur
4. prepare learning plans.

Effective planning for learning determines:

- what a student needs to do
  - by when
  - in what order
- what resources are available to the student
- what will signal success.

1. *Review Appropriate Curriculum Documents*

In CTS, the key reference is the *Guide to Standards and Implementation (GSI),* which has been developed for each of the 22 strands. The GSI is a support document. The advice and direction offered is suggestive except where is duplicates the Program of Studies.

Check the publication date (at the bottom of each page) of CTS curriculum documents to ensure they are the most recent versions. (See p. A-13–15 for CTS curriculum and support documents and the CTS Internet site).

The Program of Studies—a prescriptive description of the expectations of student learning, focusing on what students are expected to know and be able to do—is issued under the authority of the Minister of Education pursuant to section 25(1) of the *School Act*, Statutes of Alberta, 1988, Chapter S-3.1 as amended, and is required for implementation. Within the GSI document, the Program of Studies is shaded so that the reader may readily identify all prescriptive statements or segments.

Each *Guide to Standards and Implementation* has 11 sections:

- Section A – an overview of the CTS program rationale/philosophy and organization
- Section B – an overview of the strand rationale/philosophy, organization, scope and sequence and module descriptions
- Section C – suggestions for planning for instruction of the strand
- competencies (module learner expectations and specific learner expectations) students are expected to develop in each module and the guidelines for assessing those competencies (curriculum and assessment standards):
  - Section D: introductory level modules
  - Section E: intermediate level modules
  - Section F: advanced level modules
- Section G – assessment tools that can be used to help decide if student performance meets the minimum standard
- Section H – opportunities to make connections within CTS and with other curriculum and to improve transitions between:
  - junior and senior high school
  - senior high school and the workplace and related post-secondary programs
- Section I – an extensive list of learning resources and key contacts that support curriculum delivery

See Chart A-4 for information on obtaining copies of the *Guide to Standards and Implementation* (for each strand).

Sections D, E and F also define:

- prerequisites
- module parameters: guidelines related to instructional qualifications, facilities and equipment
- supporting modules.

- Section J – a sample template for developing student learning guides and sample student learning guides for two or three modules
- Section K – acknowledgments.

2. *Select the Strands/Modules*

Schools decide which strands and modules students can access. Remember, no one school is expected to deliver all strands or all modules within a strand.

See Section A of this manual for suggested strategies for determining which strands and modules to select.

See Section B of this manual for suggestions for delivery strategies that can expand students' opportunities to access CTS strands and modules.

When selecting strands/modules, and recognizing student enrollments, consider which modules are most effectively delivered:

- *within the school* through present classroom and lab facilities. School-based opportunities for student learning can often be enhanced through use of telecommunications, team teaching, programmed learning packages, etc.
- *through off-campus* learning experiences using resources available in the community. These opportunities are enhanced by partnerships with local business and industry, post-secondary institutions and government agencies.

Schools should be careful to check that students have the required prerequisites for a module. The prerequisites, which may be another CTS module, a core course, or a complementary course, are outlined in each module in each strand's *Guide to Standards and Implementation.*

Note: When students complete CTS modules off-campus, their achievement should be reported under the strand name—not under Work Experience 15–25–35.

Schools, through regular registration procedures, will assign a teacher (or team of teachers) and a group of students to an instruction period. Additional qualifications may be recommended for some modules, particularly where students have an opportunity to earn additional credentials.

3. *Decide How and Where Learning Will Occur*

School administrators and teachers should discuss how learning will be organized, particularly related to:

- the level of flexibility or opportunity students will have:
  - to select modules
  - to progress through the modules at a rate that is personally challenging
- the resources that can be used by the teacher and students (facilities, equipment, electronic, print and media references, etc.).

CTS, as a modular competency-based curriculum, empowers schools and teachers to use the flexibility of the curriculum structure to design learning opportunities for students that:

- address their personal career goals and interests
- allow them to progress at a rate that is personally challenging.

The learning plans are affected by the nature of the strands and modules that students can access, the instructional period that has been defined, and the educational background, experience and goals of the students.

See Section C in each strand's *Guide to Standards and Implementation* for strand-specific suggestions for Planning for Instruction.

Following are some suggestions for planning for learning in CTS:

- review, in detail, the module learner expectations (MLEs) and specific learner expectations (SLEs) for each module selected
- determine the level of competence individual students bring to the course/modules. Students may be able to demonstrate:
  - *none of the competencies* specified in the module. In this case, the teacher will not need to adjust the instructional plan
  - *some of the competencies* specified in the module. In this case, the teacher can decide to:
    - allow the student to complete only those activities/projects that he or she needs to be able to demonstrate the remaining competencies (if in an open lab/classroom learning environment), or
    - direct the student to proceed with work independently on another module until the remainder of the class completes the first module and is ready to proceed to the second module (if in a lock-step lab/classroom learning environment)

Remember: **MLEs are required, SLEs are not**. SLEs provide a guideline, or framework, to help teachers and students understand the depth and scope of learning expected for the competency defined in the MLE.

Refer to Course Challenge Policy from the school system and Alberta Education. See *Guide to Education: ECS to Grade 12 Handbook, 1997.*

- *all of the competencies* specified in the module. In this case, the student should be given the opportunity to take an alternative module that further develops his or her level of expertise or broadens the learning experience.

4. *Prepare Learning Plans*

Once the level of individualization, availability of resources and student's entry-level competencies are determined, teachers need to prepare learning plans. Learning plans will determine how the competencies defined within module(s) will be developed and assessed.

Information on assessing student achievement is provided later in this section of this manual and in Appendix 12, "Assessing Student Achievement in CTS."

Learning plans should address both the **basic competencies** (see Chart C-2) and **strand-specific competencies** (as outlined in the module learner expectations).

Consider involving students and peers in the formative assessment procedures.

The instructional or learning plan will, in general, include:

- assignments/projects/tasks designed to develop the various competencies
- strategies to assess if student performance meets the required standard for the competencies
- resources that could/should be accessed
- timelines and work/lab schedules.

Sample Learning Plans for a Module

Learning plans for a CTS module can be considered the same as unit outlines/lesson plans for other courses.

Two or three sample student learning guides (SLGs) have been included in Section J of each strand's *Guide to Standards and Implementation*. Teachers can use these SLGs for:

- individual learning
- small group learning
- large group learning.

See Appendix 11, "Student Learning Guide Development Matrix and Directory," for further information on developing and sharing student learning guides as well as a list of available student learning guides and distance learning packages.

Instructional Strategies

Choosing appropriate instructional strategies is very important in meeting the goals of the CTS program. No one strategy is appropriate for all modules or learnings within a module.

For example, to improve students' ability to work with others, they need opportunities to use different communication strategies, to work in teams and take on leadership roles, and to demonstrate responsibility and accountability.

Ideally, teachers will be able to draw upon a wide range of instructional strategies to meet the needs of their students.

These instructional strategies will include:

- providing access to alternative resources, alternative activities and/or additional time to develop the competency
- building on the positive by helping students recognize how their present competencies and aptitudes can be used to help them learn and succeed in other contexts, both within CTS and in other endeavours.

See Appendix 9, "Strategies for Instruction," for some ideas.

In particular, the instructional strategies applied within a module are key to helping students develop the two types of competencies addressed in each CTS module:

- career-specific (e.g., keyboarding, garment production)
- basic (e.g., employability skills).

Teachers should plan learning experiences that help students:

- understand the expectations and standards of performance required to succeed in a module/course
- link theory and practice elements of any competency (some competencies defined in the MLEs may emphasize theory, others practice, but all involve both aspects to some degree)
- make connections between what students are learning in the CTS module with:
  - what they have learned or will learn in other curriculum areas
  - opportunities in the workplace or for post-secondary education.

For example, students may be given responsibilities such as safety coordination for the week and provide a written or oral report at the conclusion of the assigned responsibility.

For example, students might use CTS content to complete language arts assignments.

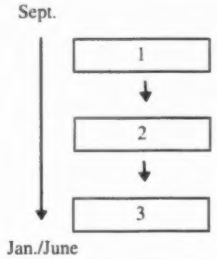
- transfer their learning to other contexts:
  - within the strand,
  - within other subject areas, or
  - outside of school
- expand their ability to use whatever learning style is most appropriate
- take responsibility for their learning and managing the resources (time, materials, etc.) that contribute to the success of the learning
- plan time for communication, positive reinforcement and feedback.

See Appendix 4, "Making Connections in CTS," for potential linkages among CTS strands and with core and complementary courses.

Students can work through modules in a variety of ways.

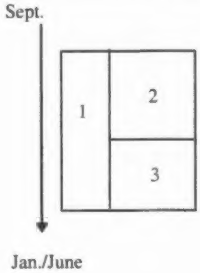
Scenario A: Students move through modules sequentially; e.g.:

INF1020 Keyboarding 1
INF2030 Keyboarding 2
INF2040 Keyboarding 3



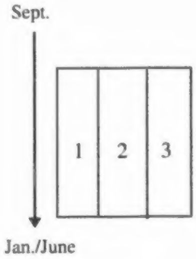
Scenario B: Students work on one module throughout the course (e.g., 20 minutes per class or one class per week) and then spend the remainder of the class time working on other modules; e.g.,

COM1010 Presentation and Communication 1(throughout the term)
COM1030 Photography 1
COM1050 Printing 1

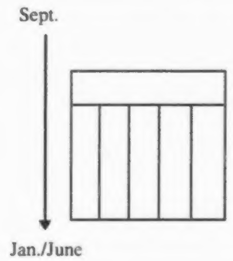


Scenario C: Students work on three modules throughout the course. This strategy is often used when students are working on an integrated project such as operating a school store or handling customer work, e.g.

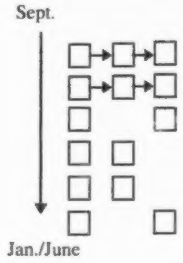
MAM*1010 Management and Marketing Basics—one class per week*
MAM1020 Quality Customer Service—first half of class
MAM2040 Retail Operations



Scenario D: All students work on one or more modules together, then are able to select from a list of modules that is available for individual or small group learning. The menu of modules could be from one or more strands.



Scenario E: From a list of modules defined by the teacher, the students select which ones they will work on and, in consultation with the teacher, establish timelines for completion and submission of assignments, etc.



Assessing Student Achievement in CTS

CTS is a competency-based program, and the assessment of student achievement is essential to its successful implementation and ongoing credibility.

Effective assessment standards and practices will:

- enhance students' achievement as they understand and target themselves to meet the requirements for a module
- establish and maintain credibility and recognition with post-secondary institutions and the workplace.

The assessment standards (How will a teacher judge student performance?) are based on the curriculum standards (What must a student know and be able to do to successfully complete the module?).

How are Curriculum Standards Described /Defined?

Curriculum standards in each CTS module are described through the following two components:

- **module learner expectations** (shaded left column of the module) define the exit-level competencies students are expected to achieve to complete a module. Each MLE defines and describes critical behaviours that can be measured and observed. The student must meet the standard specified for **ALL** MLEs within a module to receive a credit in senior high school. The MLEs describe the nature of the competency that the student is expected to demonstrate—what a student **knows** (theory) and **can do** (practice).
- **suggested emphasis** (right column of the module) provides a guideline for the relative significance of each MLE and can be used to organize for instruction.

The goal is to develop assessment standards that will be applied **consistently** throughout the province. To achieve this the assessment standards (conditions, criteria and related assessment tools) are designed to meet the following criteria:

- level of challenge and rigour is appropriate
- statements and tools reflect type of competency to be assessed (theory and/or practice)
- statements and tools are easily understood by teachers, students and other key contacts
- assessment tools are efficient to implement.

See Appendix 12, "Assessing Student Achievement in CTS," for more information on assessing student achievement in CTS.

How are Assessment Standards Described/Defined?

Assessment standards are described through the following components:

- **criteria** define the behaviours that a student must demonstrate to meet the designated standard. For example, the criteria could describe the various techniques that must be demonstrated when using a tool, and/or describe the minimum components of a project the student must complete.
- **conditions** outline the specifications under which a student's competency can be judged. For example, conditions could specify whether the assessment should be timed or not, or if the student should be allowed access to support resources or references.

Assessment standards and tools defined for each CTS module focus on the final, or **summative**, assessment of student achievement.

Assessment standards in CTS will require ongoing monitoring to ensure that they are appropriately challenging.

Defining what a student **knows** involves assessing whether the student has the knowledge base needed to demonstrate a competency (e.g., link theory and practice) and /or transfer a specific competency to another context.

Standard: The *standard* for a particular module learner expectation is defined by assessment tools, which are in Section G of the *Guide to Standards and Implementation* (or sometimes in approved learning resources).

What a student **can do** involves assessing how a student:

- **makes** a product (e.g., wood bowl, report, garment)
- **demonstrates** a process or technique related to:
  - strand-related competencies (e.g., keyboarding, haircutting, sewing techniques, lab procedures)
  - basic competencies (e.g., resource use, safety procedures, teamwork).

Assessment tools illustrate (benchmark) the standard for student achievement. Teachers may use alternative assessment tools and strategies that reflect the same level of student performance.

Assessment tools can be in several formats:

- checklists and reference guides, which are included in Section G of each strand's *Guide to Standards and Implementation*

- illustrative examples of student work (print, audio, visual, or actual product), which help teachers decide if a student's work is at standard, above standard, or not yet at standard.

As much as possible, the assessment tools developed for CTS have been consolidated for ease of use and consistency. The various assessment tools are of three general types:

- tools **generic to the CTS program, such as:**
  - "Basic Competencies Reference Guide" (Chart C-2) describes observations that could be used in each module to assess one or more of the basic competencies
  - a generic five-point rating scale is used in all strands when assessing the *process* or techniques a student applies to complete a project, task or assignment (see Chart C-3)
  - generic learning processes such as:
    - issue analysis
    - lab investigations
    - negotiation and debate
    - presentations/reports
    - research
- tools **common to a strand**
- tools **specific to a module**, e.g., assessment checklist for assessing a venture plan in Enterprise & Innovation or a checklist for sketching, drawing and modelling in Design Studies.

Students are expected to improve their basic competencies in the following areas:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility (attendance, safety, ethics).

Names of generic tools include the strand code (e.g., INF for Information Processing) and a code for the type of tool (e.g., TDENT for Text-Data entry).

Names of these tools include the module code, e.g., INF1010-1 indicating that it is the first module-specific tool used in Information Processing 1010.

BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each module. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework★. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages**. Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Managing Learning			
☐ comes to class prepared for learning	☐ →	☐ → →	☐ → →
☐ follows basic instructions, as directed	☐ follows instructions, with limited direction ☐ sets goals and establishes steps to achieve them, with direction	☐ follows detailed instructions on an independent basis ☐ sets clear goals and establishes steps to achieve them	☐ → → ☐ demonstrates self-direction in learning, goal setting and goal achievement
☐ acquires specialized knowledge, skills and attitudes	☐ applies specialized knowledge, skills and attitudes in practical situations	☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations	☐ transfers and applies learning in new situations; demonstrates commitment to lifelong learning
☐ identifies criteria for evaluating choices and making decisions	☐ identifies and applies a range of effective strategies for solving problems and making decisions	☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions	☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions
☐ uses a variety of learning strategies	☐ explores and uses a variety of learning strategies, with limited direction	☐ selects and uses effective learning strategies ☐ cooperates with others in the effective use of learning strategies	☐ → → ☐ provides leadership in the effective use of learning strategies
Managing Resources			
☐ adheres to established timelines; uses time/schedules/planners effectively	☐ creates and adheres to timelines, with limited direction; uses time/ schedules/planners effectively	☐ creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/ schedules/planners effectively	☐ creates and adheres to detailed timelines; uses time/schedules/ planners effectively; prioritizes tasks on a consistent basis
☐ uses information (material and human resources), as directed	☐ accesses and uses a range of relevant information (material and human resources), with limited direction	☐ accesses a range of information (material and human resources), and recognizes when additional resources are required	☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement
☐ uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service	☐ uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision	☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis	☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies)
☐ maintains, stores and/or disposes of equipment and materials, as directed	☐ maintains, stores and/or disposes of equipment and materials, with limited assistance	☐ maintains, stores and/or disposes of equipment and materials on an independent basis	☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation			
☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches	☐ identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints	☐ thinks critically and acts logically in the context of problem solving	☐ identifies and resolves problems efficiently and effectively
☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ applies problem-solving skills to a directed or a self-directed activity, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ transfers problem-solving skills to real-life situations, by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks	☐ identifies and suggests new ideas to get the job done creatively, by: – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— *The student:*	**Stage 2—** *The student:*	**Stage 3—** *The student:*	**Stage 4—** *The student:*
Communicating Effectively			
☐ uses communication skills; e.g., reading, writing, illustrating, speaking	☐ communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means	☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments	☐ negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests
☐ uses language in appropriate context	☐ uses technical language appropriately	☐ encourages, persuades, convinces or otherwise motivates individuals	☐ negotiates and works toward a consensus
☐ listens to understand and learn	☐ listens and responds to understand and learn	☐ listens and responds to understand, learn and teach	☐ listens and responds to under-stand, learn, teach and evaluate
☐ demonstrates positive interpersonal skills in selected contexts	☐ demonstrates positive interpersonal skills in many contexts	☐ demonstrates positive interpersonal skills in most contexts	☐ promotes positive interpersonal skills among others
Working with Others			
☐ fulfills responsibility in a group project	☐ ——▶——▶	☐ seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload	☐ leads, where appropriate, mobilizing the group for high performance
☐ works collaboratively in structured situations with peer members	☐ cooperates to achieve group results	☐ works in a team or group: – encourages and supports team members – helps others in a positive manner – provides leadership/ followership as required – negotiates and works toward consensus as required	☐ understands and works within the context of the group
☐ acknowledges the opinions and contributions of others in the group	☐ maintains a balance between speaking, listening and responding in group discussions		☐ prepares, validates and implements plans that reveal new possibilities
	☐ respects the feelings and views of others		
Demonstrating Responsibility			
Attendance			
☐ demonstrates responsibility in attendance, punctuality and task completion	☐ ——▶——▶	☐ ——▶——▶	☐ ——▶——▶
Safety			
☐ follows personal and environmental health and safety procedures	☐ recognizes and follows personal and environmental health and safety procedures	☐ establishes and follows personal and environmental health and safety procedures	☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations
☐ identifies immediate hazards and their impact on self, others and the environment	☐ identifies immediate and potential hazards and their impact on self, others and the environment	☐ ——▶——▶	☐ ——▶——▶
☐ follows appropriate/emergency response procedures	☐ ——▶——▶	☐ ——▶——▶	☐ ——▶——▶
			☐ demonstrates accountability for actions taken to address immediate and potential hazards
Ethics			
☐ makes personal judgements about whether or not certain behaviours/actions are right or wrong	☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school	☐ assesses the implications of personal/group actions within the broader community; e.g., workplace	☐ analyzes the implications of personal/group actions within the global context
			☐ states and defends a personal code of ethics as required
***Developmental Framework**			
• *Simple task* • *Structured environment* • *Directed learning*	• *Task with limited variables* • *Less structured environment* • *Limited direction*	• *Task with multiple variables* • *Flexible environment* • *Self-directed learning, seeking assistance as required*	• *Complex task* • *Open environment* • *Self-directed/self-motivated*

Chart No. C-3: CTS Framework Assessment

S C A L E	**RUBRIC STATEMENT** **(included in assessment tool/statements in *italics* are optional)** ***The student:***	**IS TASK/ PROJECT COMPLETED?**	**PROBLEM SOLVING:** **STUDENT INITIATIVE VS TEACHER DIRECTION/ SUPPORT**	**USE OF TOOLS, MATERIALS, PROCESSES**	***STANDARDS OF QUALITY/ PRODUCTIVITY***	***TEAMWORK*** ***LEADERSHIP***	***SERVICE*** ***CLIENT/*** ***CUSTOMER***
4	exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. *Quality, particularly details and finishes, and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.*	Exceeds defined outcomes.	Plans and solves problems effectively and creatively in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	*Quality, particularly details and finishes, and productivity are consistent and exceed standards.*	*Leads others to contribute team goals.*	*Analyzes and provides effective client/customer services beyond expectations.*
3	meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. *Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.*	Meets defined outcomes.	Plans and solves problems in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently and effectively.	*Quality and productivity are consistent.*	*Works cooperatively and contributes ideas and suggestions that enhance team effort.*	*Analyzes and provides effective client/customer services.*
2	meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.*	Meets defined outcomes.	Plans and solves problems with limited assistance.	Tools, materials and/or processes are selected and used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively to achieve team goals.*	*Identifies and provides customer/client services.*
1	meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.*	Meets defined outcomes.	Follows a guided plan of action.	A limited range of tools, materials and/or processes are used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively.*	*Provides a limited range of customer/client services.*
0	has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.	Has not completed defined outcomes.		Tools, materials and/or processes are used inappropriately.			

Determining Percentage Grades

Although the CTS curriculum has been designed around a competency-based model, schools still report student achievement in percentage grades to students, parents, Alberta Education and post-secondary institutions.

The time frame a teacher allows a student to develop the exit-level competency is a local decision.

Summative or Final Grading

When a senior high student can demonstrate ALL of the exit-level competencies defined for the module (module learner expectations), the teacher will designate the module as "successfully completed." The teacher will then use accepted grading practices to determine the percentage grade to be given for the module—mark not less than 50 percent.

Note: The *Guide to Education: ECS to Grade 12 Handbook* specifies that students must **have access to 25 hours of instruction** for each credit. Individual students may, however, attain the required competencies in less time and may proceed to other modules. Other students may need more time to complete the module.

Junior high schools may deliver concepts from several modules and strands and need not complete all the Module Learner Expectations (MLEs) in a particular year. It can be divided up and be delivered over a two or three year period.

The senior high school principal may accept a recommendation from the junior high school principal that a student has successfully completed a module and should be given credit.

Formative or "In-Progress" Grading

Assessment throughout the learning period (formative assessment) describes how students are progressing. Teachers direct and respond to students' efforts to learn—setting and marking tasks and assignments, indicating where improvement is needed, sending out interim reports, congratulating excellence, etc.

Teachers are encouraged to consult their colleagues and to attend inservices to ensure grading practices are as consistent as possible.

See Appendix 2, "Tracking and Reporting Student Achievement in CTS," for suggestions on how to use CTS course codes to report the credits that students have earned to Alberta Education.

Selecting and Using Resources

A comprehensive resource base, including print, software and audio-visual resources, has been identified to support each strand.

Approved Learning and Teaching Resources

Authorized resources may be obtained from the Learning Resources Distributing Centre (LRDC) or directly from the publisher or distributor. Refer to the Section I of each strand's *Guide to Standards and Implementation* for the complete resource list including curriculum correlations and resource annotations.

Use the *LRDC Buyer's Guide* print and electronic formats when ordering.

Other Resources

Section I of each *Guide to Standards and Implementation* includes a category referred to as "other resources." Resources included in this list are provided as a service only to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. Alberta Education has done a Tolerance and Understanding audit and a preliminary review of the resources. However, the responsibility to evaluate these resources prior to selection rests with the user, in accordance with any existing local policy.

Keeping up to date with other resources available, in both print and electronic media, will be assisted by the resource lists provided in Section I of each strand's *Guide to Standards and Implementation*.

Additional Sources

Section I of each strand's *Guide to Standards and Implementation* also provides information on additional sources, which refers to noncommercial or government agencies that offer resources that may be of assistance in a particular strand. For example:

- in schools:
  - school counsellors
  - teacher–librarians
- in communities:
  - Alberta Education curriculum documents
  - ACCESS: The Education Station resources
  - provincial and federal government departments and agencies
  - professional associations.

Research Skills (Alberta Education, 1990) contains a variety of research strategies.

Establishing and Maintaining Resource Centres

Schools are encouraged to establish resource centres in CTS suites/classrooms that could include:

- single or multiple copies of the various learning and teaching resources that have been approved for each strand
- copies of "other resources" listed in the Learning Resource Guide (Section I of each strand's *Guide to Standards and Implementation*)
- magazines, newsletters, etc.
- videos, CD-ROMs
- samples of student work (illustrative examples).

The resource-based classroom approach accommodates a variety of instructional strategies and teaching styles, and supports individual or small group planning. It provides students with opportunities to interact with a wide range of information sources in a variety of learning situations.

Students in CTS are encouraged to take an active role in managing their own learning. Ready access to a strong resource base enables students to learn to screen and use information appropriately, to solve problems, to meet specific classroom and learning needs, and to develop competency in reading, writing, speaking, listening and viewing.

Student Learning Guides

Sample Student Learning Guides (SLGs), designed for individual student or small group use, provide a sample instructional plan for selected modules and include the following components:

- Why take this module?
- What are the entry-level competencies?
- What are the exit-level competencies?
- What resources may be accessed?
- What assignments/activities must be completed?
- What are the timelines?
- How will the final mark be calculated?

When is a module a module?

- A CTS module is part of the curriculum document that represents a group of learnings (module learner expectations). CTS modules are located in the *Guide to Standards and Implementation*, Sections D, E and F, for each strand.
- Student Learning Guides (SLGs): guide students through activities and direct them to identified resources. SLGs are like unit plans and can be used for individualized, group or classroom instruction.
- Distance Learning Modules: self-contained learning packages and are both the resource and the student learning guide in one.

See Appendix 11, "Development Matrix and Student Learning Guide Directory," for more information on developing and sharing SLGs.

Professional Development

Ongoing, effective professional development is key to maintaining a relevant, credible CTS program of Alberta students.

Chart C-4 outlines a potential model for ongoing inservice and professional development in CTS. The model features interlocking mandates and the cooperative use of resources.

Chart C-4: Key Players Involved in Professional Development Initiatives for CTS

KEY PLAYERS	Possible Strategies/Roles
Alberta Education	• organize orientation sessions (systems or regions) • prepare/distribute materials • align administrative/support processes
Schools/School Systems	• organize workshops • prepare/distribute materials • align administrative/support processes • provide release time • obtain support resources
Regional Consortia	• organize workshops/conferences/courses • act as a clearing house for inservice programs
Professional Associations • Alberta Teachers Association (Specialist Councils) • Business/Industry • Community/Service	• organize workshops/conferences/courses • prepare/distribute materials • provide courses • provide credentialling opportunities
Teacher Training Programs • Preservice • Inservice	• provide courses • provide credentialling opportunities • provide release time • obtain support resources
Related Post-secondary Programs	• provide courses • provide credentialling opportunities • provide release time • obtain support resources

Effective preservice, inservice and professional development plans are particularly important in CTS because of the *scope* and *nature* of the curriculum: CTS affects not only "What students will learn," but, through the modular, competency-based curriculum structure, also "How students will learn" and "How will we assess whether the competencies have been achieved."

Roles:

"What a student is to learn" — defined in curriculum (module learner expectations)

"How a student is to learn" — determined locally by the teacher, school and school system (learning/instructional strategies).

As well, the program is based on two key concepts, which, by their very nature, are under constant change—"careers" and "technologies."

CTS involves:

- new areas of learning (e.g., Tourism Studies, Enterprise & Innovation, Forestry)
- updated processes and technologies (e.g., computer-assisted design)
- updated and expanded learning and teaching resources
- expanded delivery strategies, both on-campus and off-campus (e.g., more community partnerships, use of telecommunications for on-line learning)
- more local decision making regarding instructional and assessment processes.

See Chart B-3 for a summary of professional development needs for each strand.

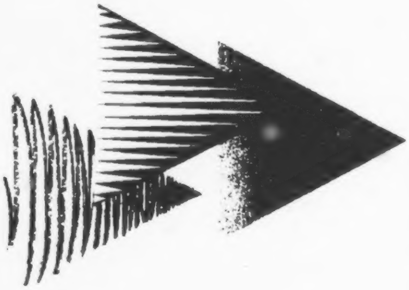
Awareness
↓
Acceptance
↓
Confidence
↓
Competence
↓
Action

Chart C-5 describes the changing perspectives for teachers of CTS to consider.

Chart C-5: Changing Perspectives

	Role/Focus		
	Teacher	School Admin.	System Admin.
***Awareness: Become aware** of CTS and the potential impact it will have on his or her responsibilities:* Includes understanding the rationale/philosophy, process for development/validation, timelines, scope of program, etc.	P	S	S
***Acceptance: Accept change,** recognizing that CTS is being implemented and changes must be made:* Includes belief that change will be better for students, recognition of government/department commitment, benefit, identification of available resources, etc.	P	P	S
***Confidence: Build confidence** that the resources to implement the program are in place, can be developed or acquired:* Includes understanding of: • increased integration of technologies and cross-curricular learning • expanded delivery options (on-campus, off-campus, telecommunications, etc.) • changes to administrative structures and procedures (shift from time-based to competency-based program planning for students)	P	P	S
***Competence: Expand skill sets** needed to deliver the curriculum:* Includes awareness of sources of support and: • knowledge of what learnings are in the strands/modules and what resources are available to deliver these learnings • ability to demonstrate and use the new technologies/processes included in the modules • expanded instructional practices, including individual/small group instruction	P	S	S
***Action: Take action** to prepare for and implement CTS:* Includes establishing and motivating a team, reviewing and assessing strategies already underway, changing what/how/when students learn.	P	P	P

P = Primary Role S = Support Role



CAREER & TECHNOLOGY STUDIES

Manual for Administrators,
Counsellors and Teachers

Appendix 1:

Scope and Sequence Charts and Module Descriptions

August 1997 (Interim)

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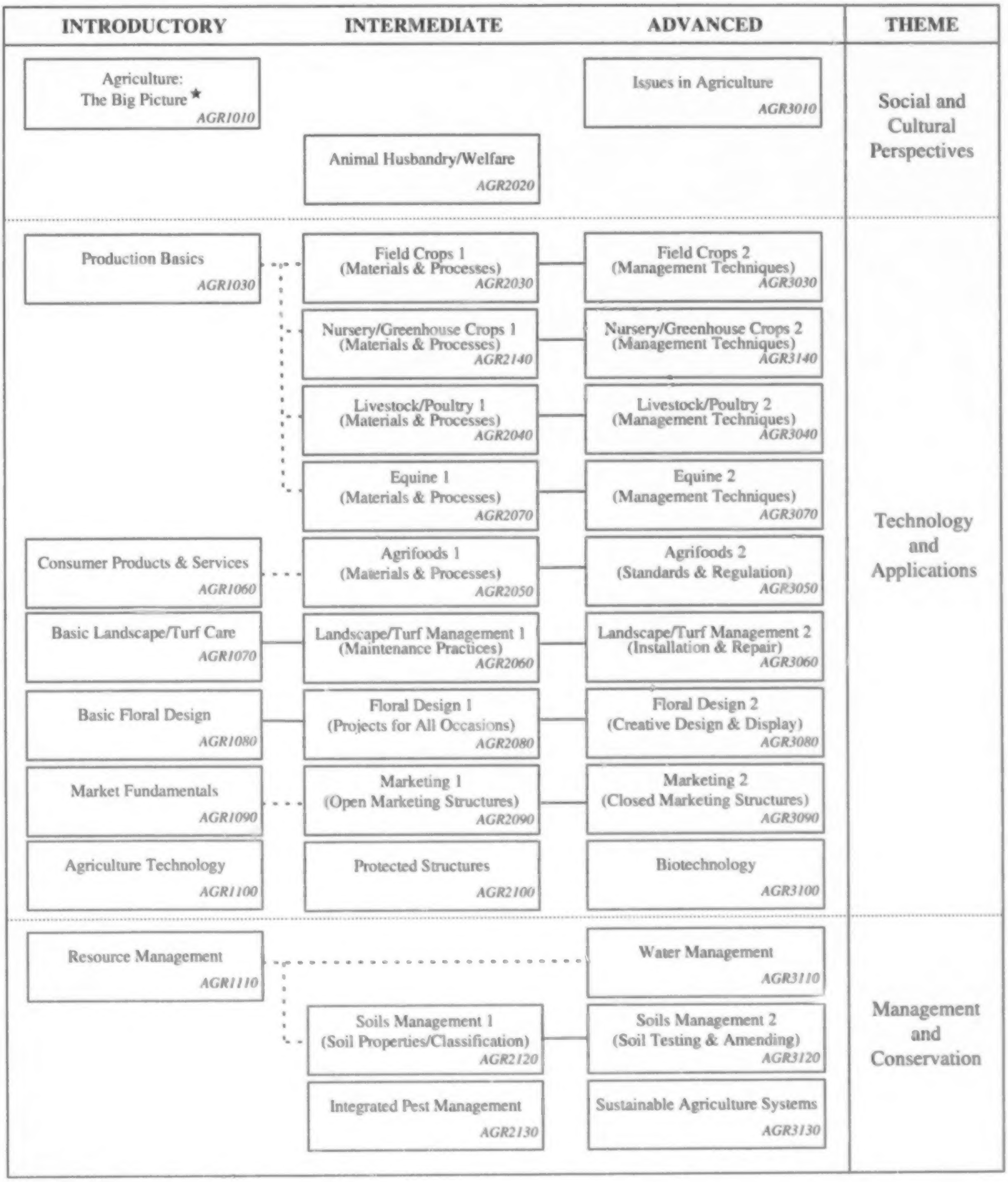
SCOPE AND SEQUENCE AGRICULTURE



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Agriculture: The Big Picture ★ AGR1010		Issues in Agriculture AGR3010	Social and Cultural Perspectives
	Animal Husbandry/Welfare AGR2020		
Production Basics AGR1030	Field Crops 1 (Materials & Processes) AGR2030	Field Crops 2 (Management Techniques) AGR3030	Technology and Applications
	Nursery/Greenhouse Crops 1 (Materials & Processes) AGR2140	Nursery/Greenhouse Crops 2 (Management Techniques) AGR3140	
	Livestock/Poultry 1 (Materials & Processes) AGR2040	Livestock/Poultry 2 (Management Techniques) AGR3040	
	Equine 1 (Materials & Processes) AGR2070	Equine 2 (Management Techniques) AGR3070	
Consumer Products & Services AGR1060	Agrifoods 1 (Materials & Processes) AGR2050	Agrifoods 2 (Standards & Regulation) AGR3050	
Basic Landscape/Turf Care AGR1070	Landscape/Turf Management 1 (Maintenance Practices) AGR2060	Landscape/Turf Management 2 (Installation & Repair) AGR3060	
Basic Floral Design AGR1080	Floral Design 1 (Projects for All Occasions) AGR2080	Floral Design 2 (Creative Design & Display) AGR3080	
Market Fundamentals AGR1090	Marketing 1 (Open Marketing Structures) AGR2090	Marketing 2 (Closed Marketing Structures) AGR3090	
Agriculture Technology AGR1100	Protected Structures AGR2100	Biotechnology AGR3100	
Resource Management AGR1110		Water Management AGR3110	Management and Conservation
	Soils Management 1 (Soil Properties/Classification) AGR2120	Soils Management 2 (Soil Testing & Amending) AGR3120	
	Integrated Pest Management AGR2130	Sustainable Agriculture Systems AGR3130	

——— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

MODULE DESCRIPTIONS

Module AGR1010: Agriculture: The Big Picture
Students demonstrate knowledge of the diversity and significance of agriculture, and they identify career opportunities within the industry.

Module AGR1030: Production Basics
Students demonstrate the basic steps involved in planting, growing and harvesting a plant commodity; or in raising, growing and finishing an animal commodity, and they identify related career opportunities.

Module AGR1060: Consumer Products & Services
Students demonstrate the basic steps involved in processing (adding value to) an agriculture commodity and/or in providing related services, and they identify career opportunities in agriculture processing.

Module AGR1070: Basic Landscape/Turf Care
Students demonstrate knowledge of the techniques used to perform basic landscape and turf care services, focusing attention on plant identification, equipment and supplies and basic maintenance tasks; and they identify related career opportunities.

Module AGR1080: Basic Floral Design
Students demonstrate knowledge of the techniques used to construct basic floral designs and arrangements, focusing attention on plant and flower identification, care and handling of fresh cut flowers and foliage, and simple fresh/dried/artificial arrangements; and they identify related career opportunities.

Module AGR1090: Market Fundamentals
Students explain the basic principles involved in marketing a plant or animal product or service, and they identify related career opportunities.

Module AGR1100: Agriculture Technology
Students describe applications of science and technology within an agriculture or horticulture industry.

Module AGR1110: Resource Management
Students describe the practices used to manage water, soil and land use; and they present the results of research on one or more related issues in agriculture.

Module AGR2020: Animal Husbandry/ Welfare
Students apply the principles of animal science and health technology in providing care for a domestic animal.

Module AGR2030: Field Crops 1 (Materials & Processes)
Students apply knowledge of materials and processes in growing a field crop, focusing attention on plant anatomy and identification, growth requirements, physical structures and equipment and practical production tasks; and they identify related career opportunities. Potential areas of specialization include the production of cereals, forage, oil seeds, pulse crops, mushrooms, spices/herbs, vegetables, fruits, medicinal plants and exotic plants.

Module AGR2040: Livestock/Poultry 1 (Materials & Processes)
Students apply knowledge of materials and processes in raising livestock, poultry or other animal commodities, focusing attention on anatomy and identification, rations and feeding, housing, animal handling and restraint, animal health and welfare, and care for the young; and they identify related career opportunities. Potential areas of specialization include the production of beef, dairy, poultry, swine, sheep, game, exotics and bees and/or the study of aquaculture.

Module AGR2050: Agrifoods 1 (Materials & Processes)
Students demonstrate knowledge of materials and processes used in producing an agrifood product or in providing a related service, focusing attention on industry inputs, and processing technologies and practices; and they identify related career opportunities. Potential areas of investigation include dairy, beef, pork, poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Module AGR2060: Landscape/Turf Management 1 (Maintenance Practices)
Students demonstrate the techniques used to provide landscape and turf maintenance services, focusing attention on plant identification, equipment maintenance, effective landscape practices, cost analysis and pricing. Potential areas of specialization include home landscapes, golf courses, recreational fields and parks, institutional/industrial grounds and roadside landscapes.

Module AGR2070: Equine 1 (Materials & Processes)
Students demonstrate practical skills and approved practices in providing for the daily care of a horse, focusing attention on the origin and history of horses, anatomy and conformation, types and breeds, handling and feeding practices, and basic health care; and they identify related career opportunities.

Module AGR2080: Floral Design 1 (Projects for All Occasions)
Students demonstrate knowledge of the practices involved in providing floral design and interior plantscape services, focusing attention on plant and flower identification, elements and principles of design, floral projects for all occasions, interior plant care and marketing practices.

Module AGR2090: Marketing 1 (Open Marketing Structures)
Students apply knowledge of general marketing principles within the context of an agriculture or horticulture industry, focusing attention on materials and services offered to the consumer through open (free enterprise) marketing structures and marketing techniques; and they identify related career opportunities.

Module AGR2100: Protected Structures
Students identify essential components of a controlled growing/living environment and demonstrate the techniques used to manage the growing/living environment within a protected enclosure.

Module AGR2120: Soils Management 1 (Soil Properties/Classification)
Students examine soil formation and classification, conduct tests to determine the physical and chemical properties of soils, and they explain the impact of soil properties on productivity.

Module AGR2130: Integrated Pest Management
Students apply knowledge of biological, cultural and chemical pest-control measures within the context of an agriculture, horticulture or forest industry.

Module AGR2140: Nursery/Greenhouse Crops 1 (Materials & Processes)
Students apply knowledge of materials and processes in growing a nursery or greenhouse crop, focusing attention on plant anatomy and identification, growth requirements, physical structures and equipment, and practical production tasks; and they identify related career opportunities.

Module AGR3010: Issues in Agriculture
Students analyze a range of issues relevant to agriculture and food production, and they develop strategies for dealing with agriculture issues within a global context.

Module AGR3030: Field Crops 2 (Management Techniques)
Students demonstrate the techniques used to produce a field crop, focusing attention on industry trends, enterprise selection, genetics and reproduction, and production skills. Potential areas of specialization include the production of cereals, forage, oil seeds, pulse crops, mushrooms, spices/herbs, vegetables, fruits, medicinal plants and exotic plants.

Module AGR3040: Livestock/Poultry 2 (Management Techniques)
Students demonstrate the techniques used to manage production of livestock, poultry or other animal commodities, focusing attention on industry trends and opportunities, genetics and reproduction, rations and feeding, housing, animal handling and restraint, animal health and welfare, breeding operations and care for the young. Potential areas of specialization include the production of beef, dairy, poultry, swine, sheep, game, exotics and bees and/or the study of aquaculture.

Module AGR3050: Agrifoods 2 (Standards & Regulation)
Students demonstrate knowledge of the techniques used to manage the development of an agrifood product or related service, focusing attention on government regulation and control, economic principles, product quality and safety, environmental impact and industry trends. Potential areas of investigation include dairy, beef, pork, poultry, cereals, oil seeds, sugar beets, wine, fruits/vegetables and honey.

Module AGR3060: Landscape/Turf Management 2 (Installation & Repair)
Students demonstrate the techniques used to provide landscape and turf management services, focusing attention on plant identification, effective maintenance practices, diagnosis and correction of problems, installation of specialty items, cost analysis and seasonal estimates. Potential areas of specialization include home landscapes, golf courses, recreational fields and parks, institutional/industrial grounds and roadside landscapes.

Module AGR3070: Equine 2 (Management Techniques)
Students demonstrate practical skills and approved practices in providing for the daily care of a horse, focusing attention on the use of physical facilities, procedures for stall cleaning and bedding a horse, guidelines for turnout and shelter, reproductive fundamentals and techniques, and basic horsemanship.

Module AGR3080: Floral Design 2 (Creative Design & Display)
Students demonstrate knowledge of the practices involved in providing creative floral design services, focusing attention on plant and flower identification, more advanced design techniques, floral services for special occasions and promotional displays of floral services offered.

Module AGR3090: Marketing 2 (Closed Marketing Structures)
Students explain specialized applications of marketing within closed (supply managed) marketing structures, focusing attention on regulatory agencies/policies that influence the supply of a commodity, product or service.

Module AGR3100: Biotechnology
Students present the results of research on applications of biotechnology in agriculture and food production.

Module AGR3110: Water Management
Students explain principles of water management and establish appropriate water management practices for an agriculture or horticulture enterprise.

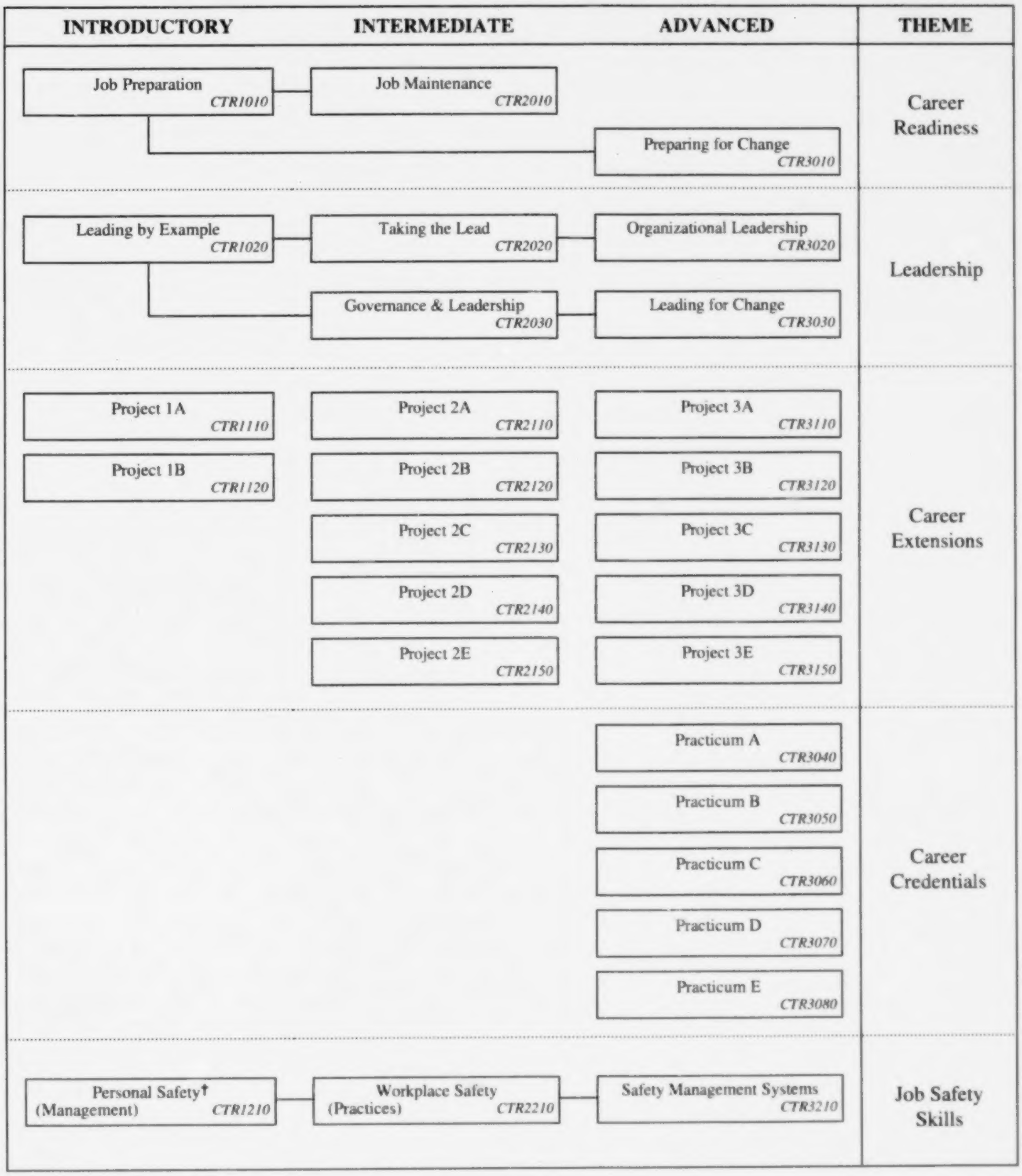
Module AGR3120: Soils Management 2 (Soil Testing & Amending)
Students demonstrate knowledge of appropriate soil testing and amending techniques, and they interpret soil survey maps and reports.

Module AGR3130: Sustainable Agriculture Systems
Students examine the impact of a range of agriculture practices on the environment, and they propose strategies for ensuring the sustainable use of natural resources.

Module AGR3140: Nursery/Greenhouse Crops 2 (Management Techniques)
Students demonstrate techniques used to produce a nursery or greenhouse crop, focusing attention on enterprise selection, plant identification, genetics and reproduction, production skills and venture analysis.

SCOPE AND SEQUENCE

CAREER TRANSITIONS



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Job Preparation *CTR1010*	Job Maintenance *CTR2010*		Career Readiness
		Preparing for Change *CTR3010*	
Leading by Example *CTR1020*	Taking the Lead *CTR2020*	Organizational Leadership *CTR3020*	Leadership
	Governance & Leadership *CTR2030*	Leading for Change *CTR3030*	
Project 1A *CTR1110*	Project 2A *CTR2110*	Project 3A *CTR3110*	Career Extensions
Project 1B *CTR1120*	Project 2B *CTR2120*	Project 3B *CTR3120*	
	Project 2C *CTR2130*	Project 3C *CTR3130*	
	Project 2D *CTR2140*	Project 3D *CTR3140*	
	Project 2E *CTR2150*	Project 3E *CTR3150*	
		Practicum A *CTR3040*	Career Credentials
		Practicum B *CTR3050*	
		Practicum C *CTR3060*	
		Practicum D *CTR3070*	
		Practicum E *CTR3080*	
Personal Safety† (Management) *CTR1210*	Workplace Safety (Practices) *CTR2210*	Safety Management Systems *CTR3210*	Job Safety Skills

—— Prerequisite - - - - Recommended sequence

† Module is also offered in Community Health.

MODULE DESCRIPTIONS

Module CTR1010: Job Preparation
Students develop successful employment search skills and a personal employment search portfolio.

Module CTR1020: Leading by Example
Students develop awareness of the principles and practices of leadership and develop, implement and assess a personal leadership plan.

Module CTR1110: Project 1A
Module CTR1120: Project 1B
Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Module CTR1210: Personal Safety (Management)
Students develop practical safety-related knowledge, skills and attitudes, and obtain certification in emergency first aid.

Module CTR2010: Job Maintenance
Students acquire knowledge about workplace requirements, rights and responsibilities and relate this knowledge to personal career/employment expectations.

Module CTR2020: Taking the Lead
Students compare basic theories and styles of leadership, and demonstrate leadership in a school, workplace or community context.

Module CTR2030: Governance & Leadership
Students are introduced to governance, its place within the administrative structure of a school or community, including the roles, responsibilities, practices and procedures for participating in governance and leadership.

Module CTR2110: Project 2A
Module CTR2120: Project 2B
Module CTR2130: Project 2C
Module CTR2140: Project 2D
Module CTR2150: Project 2E
Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Module CTR2210: Workplace Safety (Practices)
Students explore workplace safety principles and practices, and apply these principles and practices to a variety of contexts.

Module CTR3010: Preparing for Change
Students develop knowledge and skills relating to the changing labour market, and relate these changes to analyzing and refining personal career plans.

Module CTR3020: Organizational Leadership
Students develop an understanding of the concept of organizations, and demonstrate leadership by establishing an organization and leading it to achieve a stated goal.

Module CTR3030: Leading for Change
Students investigate change and decision-making processes used in the school and/or community. They construct, propose and initiate the use of a project planning model to affect change.

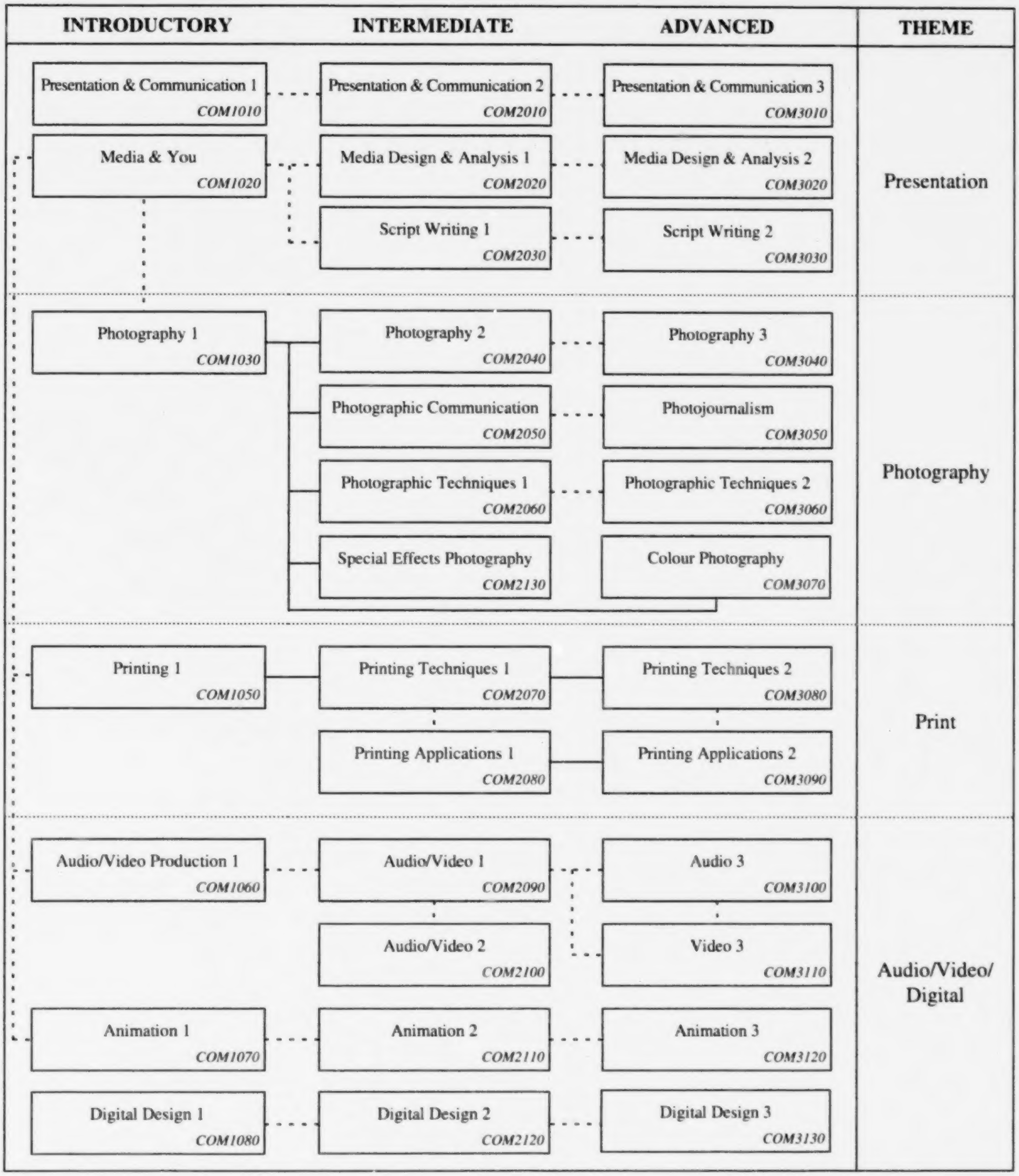
Module CTR3040: Practicum A
Module CTR3050: Practicum B
Module CTR3060: Practicum C
Module CTR3070: Practicum D
Module CTR3080: Practicum E
Students, on the worksite, continue to develop and refine those competencies developed in related Career and Technology Studies modules, previous practicums and other experiences.

Module CTR3110: Project 3A
Module CTR3120: Project 3B
Module CTR3130: Project 3C
Module CTR3140: Project 3D
Module CTR3150: Project 3E
Students, through projects, extend and enhance competencies developed in the Career Transitions strand or other Career and Technology Studies strands to contexts that are personally relevant.

Module CTR3210: Safety Management Systems
Students conduct an in-depth investigation of safety management systems and demonstrate the ability to design a safety program for a selected business/industry.

SCOPE AND SEQUENCE

COMMUNICATION TECHNOLOGY



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Presentation & Communication 1 *COM1010*	Presentation & Communication 2 *COM2010*	Presentation & Communication 3 *COM3010*	Presentation
Media & You *COM1020*	Media Design & Analysis 1 *COM2020*	Media Design & Analysis 2 *COM3020*	
	Script Writing 1 *COM2030*	Script Writing 2 *COM3030*	
Photography 1 *COM1030*	Photography 2 *COM2040*	Photography 3 *COM3040*	Photography
	Photographic Communication *COM2050*	Photojournalism *COM3050*	
	Photographic Techniques 1 *COM2060*	Photographic Techniques 2 *COM3060*	
	Special Effects Photography *COM2130*	Colour Photography *COM3070*	
Printing 1 *COM1050*	Printing Techniques 1 *COM2070*	Printing Techniques 2 *COM3080*	Print
	Printing Applications 1 *COM2080*	Printing Applications 2 *COM3090*	
Audio/Video Production 1 *COM1060*	Audio/Video 1 *COM2090*	Audio 3 *COM3100*	Audio/Video/ Digital
	Audio/Video 2 *COM2100*	Video 3 *COM3110*	
Animation 1 *COM1070*	Animation 2 *COM2110*	Animation 3 *COM3120*	
Digital Design 1 *COM1080*	Digital Design 2 *COM2120*	Digital Design 3 *COM3130*	

——— Prerequisite

. . . . Recommended sequence

MODULE DESCRIPTIONS

Module COM1010: Presentation & Communication 1
Students communicate by using speech, body language and audio/visual materials and equipment.

Module COM1020: Media & You
Students are provided with a hands-on introduction to the various segments of communication studies: presentation and communication, photography, print, and audio/video production.

Module COM1030: Photography 1
Students operate a camera to take photographs and produce prints.

Module COM1050: Printing 1
Students are introduced to basic layout/design techniques and to various print reproduction processes; e.g., offset, screen, electrostatic.

Module COM1060: Audio/Video Production 1
Students acquire basic production skills through the use of simple audio and/or video equipment and techniques.

Module COM1070: Animation 1
Students are introduced to a variety of animation techniques and are given the opportunity to produce simple animation.

Module COM1080: Digital Design 1
Students are introduced to the integration of various media; e.g., audio, video, photographic, graphic, for the purpose of producing a multimedia message.

Module COM2010: Presentation & Communication 2
Students use verbal and nonverbal communication skills to produce and deliver presentations incorporating a variety of media.

Module COM2020: Media Design & Analysis 1
Students explore various media and examine their impact on personal, community and national interests.

Module COM2030: Script Writing 1
Students write sample scripts for a variety of media forms.

Module COM2040: Photography 2
Students review and expand on the concepts outlined in Basic Photography 1, including composition, exposure, camera operation, image processing, proofing and enlarging.

Module COM2050: Photographic Communication
Students use photographic prints, slides or digital images to communicate a message or tell a story.

Module COM2060: Photographic Techniques 1
Students expand photographic concepts using various lenses and applying depth of field in composition.

Module COM2070: Printing Techniques 1
Students are introduced to single-register reproductive printing.

Module COM2080: Printing Applications 1
Students apply the technique of single-register printing to practical situations.

Module COM2090: Audio/Video 1
Students expand on basic audio/video production techniques.

Module COM2100: Audio/Video 2
Students build on production skills through application of preproduction and post-production techniques.

Module COM2110: Animation 2
Students build skills in planning, idea development and storytelling technique, and their application through various animation methods.

Module COM2120: Digital Design 2
Students enhance their abilities to integrate various media for the purpose of producing a multimedia message for a target audience, using the computer as a significant production tool.

Module COM2130: Special Effects Photography
Students are introduced to the creative use of the camera, the darkroom and/or digital techniques, in order to produce various photographic effects.

Module COM3010: Presentation & Communication 3
Students refine presentation skills specific to a target audience.

Module COM3020: Media Design & Analysis 2
Students use school and/or community resources to produce messages for a target audience to be delivered through two or more media.

Module COM3030: Script Writing 2
Students refine script-writing skills by producing scripts for specific media formats.

Module COM3040: Photography 3
Students apply various light sources, multiple lighting arrangements and metering techniques with an emphasis on flash and studio lighting.

Module COM3050: Photojournalism
Students are introduced to photojournalism.

Module COM3060: Photographic Techniques 2
Students create special photographic effects through a variety of approaches, including advanced enlarging techniques, high contrast derivations, toning, retouching and print presentation.

Module COM3070: Colour Photography
Students are introduced to colour photography.

Module COM3080: Printing Techniques 2
Students are introduced to multiregister reproductive printing.

Module COM3090: Printing Applications 2
Students apply the technique of multiregister printing to practical situations.

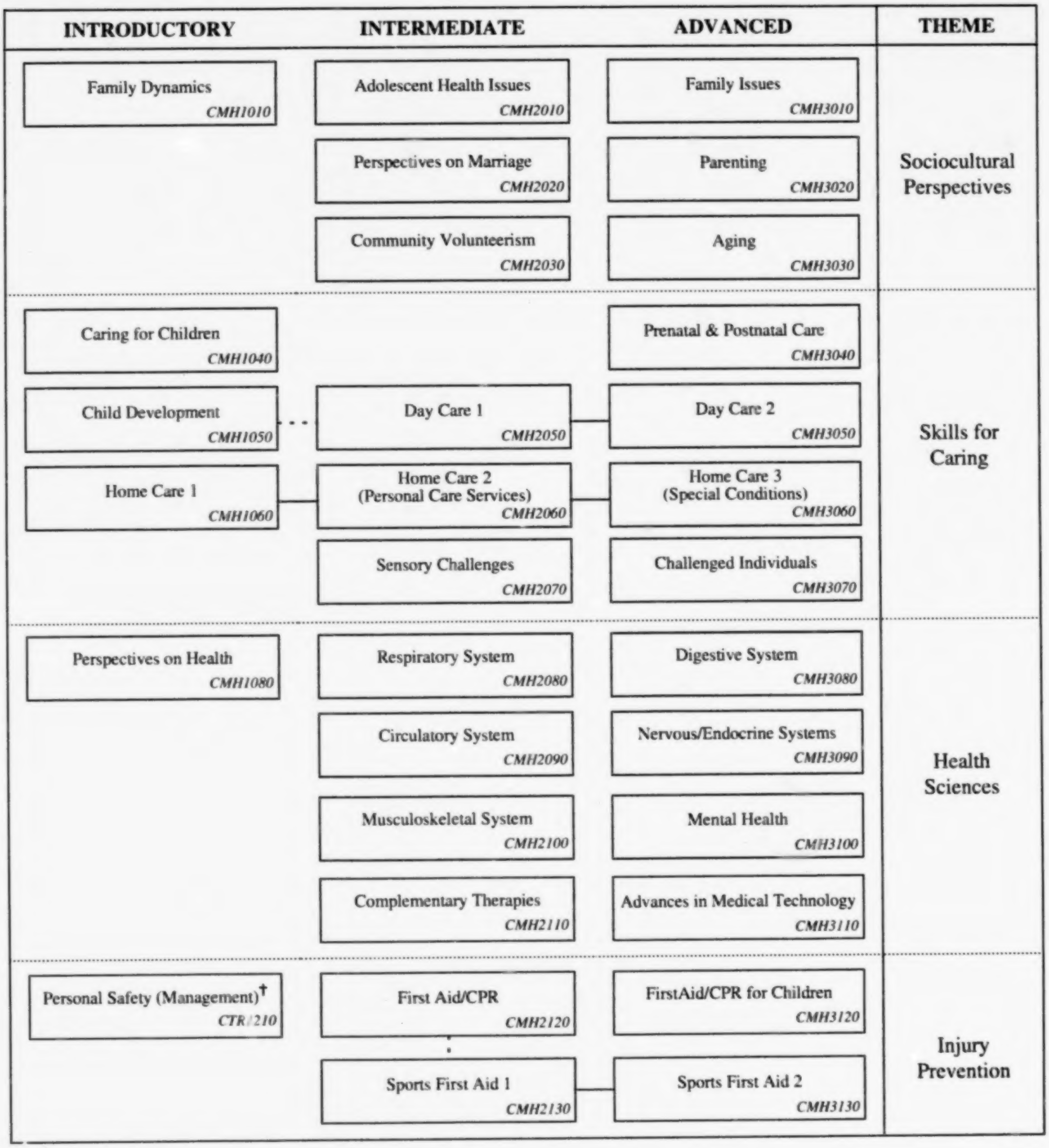
Module COM3100: Audio 3
Students plan, develop and produce specific audio projects.

Module COM3110: Video 3
Students plan, develop and produce specific video projects.

Module COM3120: Animation 3
Students apply production planning techniques to produce animation that tells a story, communicates an idea or message, or creates a mood or theme. Students select and employ traditional animation techniques for the project work..

Module COM3130: Digital Design 3
Students develop and produce multimedia messages within a common theme and for a client who has an identified target audience. Students select and use a variety of media and justify their selection based on the strengths of the media and appropriateness to the task. Digital technology forms a key link in all project work.

SCOPE AND SEQUENCE COMMUNITY HEALTH



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Family Dynamics *CMH1010*	Adolescent Health Issues *CMH2010*	Family Issues *CMH3010*	Sociocultural Perspectives
	Perspectives on Marriage *CMH2020*	Parenting *CMH3020*	
	Community Volunteerism *CMH2030*	Aging *CMH3030*	
Caring for Children *CMH1040*		Prenatal & Postnatal Care *CMH3040*	Skills for Caring
Child Development *CMH1050*	Day Care 1 *CMH2050*	Day Care 2 *CMH3050*	
Home Care 1 *CMH1060*	Home Care 2 (Personal Care Services) *CMH2060*	Home Care 3 (Special Conditions) *CMH3060*	
	Sensory Challenges *CMH2070*	Challenged Individuals *CMH3070*	
Perspectives on Health *CMH1080*	Respiratory System *CMH2080*	Digestive System *CMH3080*	Health Sciences
	Circulatory System *CMH2090*	Nervous/Endocrine Systems *CMH3090*	
	Musculoskeletal System *CMH2100*	Mental Health *CMH3100*	
	Complementary Therapies *CMH2110*	Advances in Medical Technology *CMH3110*	
Personal Safety (Management)† *CTR1210*	First Aid/CPR *CMH2120*	FirstAid/CPR for Children *CMH3120*	Injury Prevention
	Sports First Aid 1 *CMH2130*	Sports First Aid 2 *CMH3130*	

——— Prerequisite - - - - Recommended sequence

† Module is also offered in Career Transitions.

MODULE DESCRIPTIONS

Module CMH1010: Family Dynamics

Students examine family structures, and roles and responsibilities, involved in meeting the demands of today's society. Students study past family and health patterns to determine how such patterns influence family life now and in the future.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH1040: Caring for Children

Students focus on accident prevention, handling emergencies, and the rights and responsibilities of the caregiver (babysitter) and the families.

Module CMH1050: Child Development

Students examine the needs and behaviours of children in various stages of development, and demonstrate management and caregiving skills applicable to each developmental stage. Students identify various community care facilities and observe how different centres meet the needs of the children and family. Students explore their interest in working with young children.

Module CMH1060: Home Care 1

Students study the roles, rights and responsibilities, communication and management skills necessary to providing home care. To further gain understanding of home care, students study the promotion and maintenance of a healthy integumentary system. Community support resources are identified.

Module CMH1080: Perspectives on Health

Students identify the determinants of good health, and examine how these determinants affect personal well-being. Students also discuss the shared roles, rights and responsibilities of health services and the changing trends in health.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CTR1210: Personal Safety (Management)

Students develop practical safety-related knowledge, skills and attitudes, and obtain certification in emergency first aid.

Module CMH2010: Adolescent Health Issues

Students explore and examine various health issues that are of interest to modern adolescent teens, and identify community resources available to teenagers.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH2020: Perspectives on Marriage

Students examine relationships and related issues as they apply to marital relationships, and acquire life skills that will help them now and in the future.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH2030: Community Volunteerism

Students, through exploration and participation, examine and demonstrate the roles of effective community volunteers.

Module CMH2050: Day Care 1

Students investigate the roles and responsibilities of a child care worker, and develop communication and observation skills. Students also develop skills to assist in the physical, social, emotional and intellectual development of children from birth to age six.

Module CMH2060: Home Care 2 (Personal Care Services)

Students identify and demonstrate the skills necessary to provide personal care services for individuals with special needs, recognizing the impact on the individual and family members.

Module CMH2070: Sensory Challenges
Students examine sensory challenges and the impact on the individual and family dynamics, and identify available community resources and technologies. Students also have an opportunity to study communication skills for sensory challenged individuals.

Module CMH2080: Respiratory System
Students study the anatomy, physiology and pathology of the respiratory system to gain an appreciation for practicing a healthy lifestyle, and to acquire the knowledge and skills necessary to deal with respiratory conditions as they affect the individual, family and friends. Students also identify community support resources.

Module CMH2090: Circulatory System
Students study the anatomy, physiology and pathology of the circulatory system to gain an appreciation for practicing a healthy lifestyle, and to acquire the knowledge and skills necessary to deal with circulatory conditions as they affect the individual, family and friends. Students also identify community support resources.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH2100: Musculoskeletal System
Students study the anatomy, physiology and pathology of the musculoskeletal system to gain an appreciation for practicing a healthy lifestyle, and to acquire the knowledge and skills necessary to deal with musculoskeletal conditions as they affect the individual, family and friends. Students also identify community support resources.

Module CMH2110: Complementary Therapies
Students examine complementary therapies, their foundations, applications, costs, ethical issues and predictions for the future.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH2120: First Aid/CPR
Students study first-aid skills, and demonstrate techniques and procedures for dealing with emergency situations.

Module CMH2130: Sports First Aid 1
Students learn different aspects of sports injuries, first-aid care and prevention of athletic injuries.

Module CMH3010: Family Issues
Students examine changes that occur within a family and the required adjustments family members must make. Cultural diversities are investigated and community resources are identified.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3020: Parenting
Students examine parenting, current family dynamics and related issues, and enhance potential parenting skills.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3030: Aging
Students gain an understanding of the issues involved with the aging process and the impact of such issues on the individual, the family and the community. Students identify community resources and recognize the importance of seniors as a resource to the community.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3040: Prenatal & Postnatal Care
Students focus on the impact of pregnancy on physical, mental and social well-being, and understand the significance of prenatal, labour, delivery and postnatal care.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3050: Day Care 2
Students continue to study the development and care of children, focusing on the importance of play and guiding behaviour.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3060: Home Care 3 (Special Conditions)
Students continue to learn about home care as it relates to special conditions, special treatments, loss, long-term care and the palliative process.

Note: This module includes concepts that may be particularly sensitive to students, parents or community members.

Module CMH3070: Challenged Individuals
Students recognize the diversity of experiences facing individuals who are physically and/or mentally challenged, and identify available community resources for such individuals.

Module CMH3080: Digestive System
Students study the anatomy, physiology, pathology and treatment of the digestive and elimination systems. They gain an appreciation for practicing a healthy lifestyle, and acquire the knowledge and skills necessary to deal with digestive and elimination conditions as they affect the individual, family and friends. Students also identify community support resources.

Module CMH3090: Nervous/Endocrine Systems
Students study the anatomy, physiology and pathology of the nervous/endocrine systems. They gain an appreciation for practicing a healthy lifestyle, and acquire the knowledge and skills necessary to deal with nervous/endocrine conditions as they affect the individual, family and friends. Students also identify community support resources.

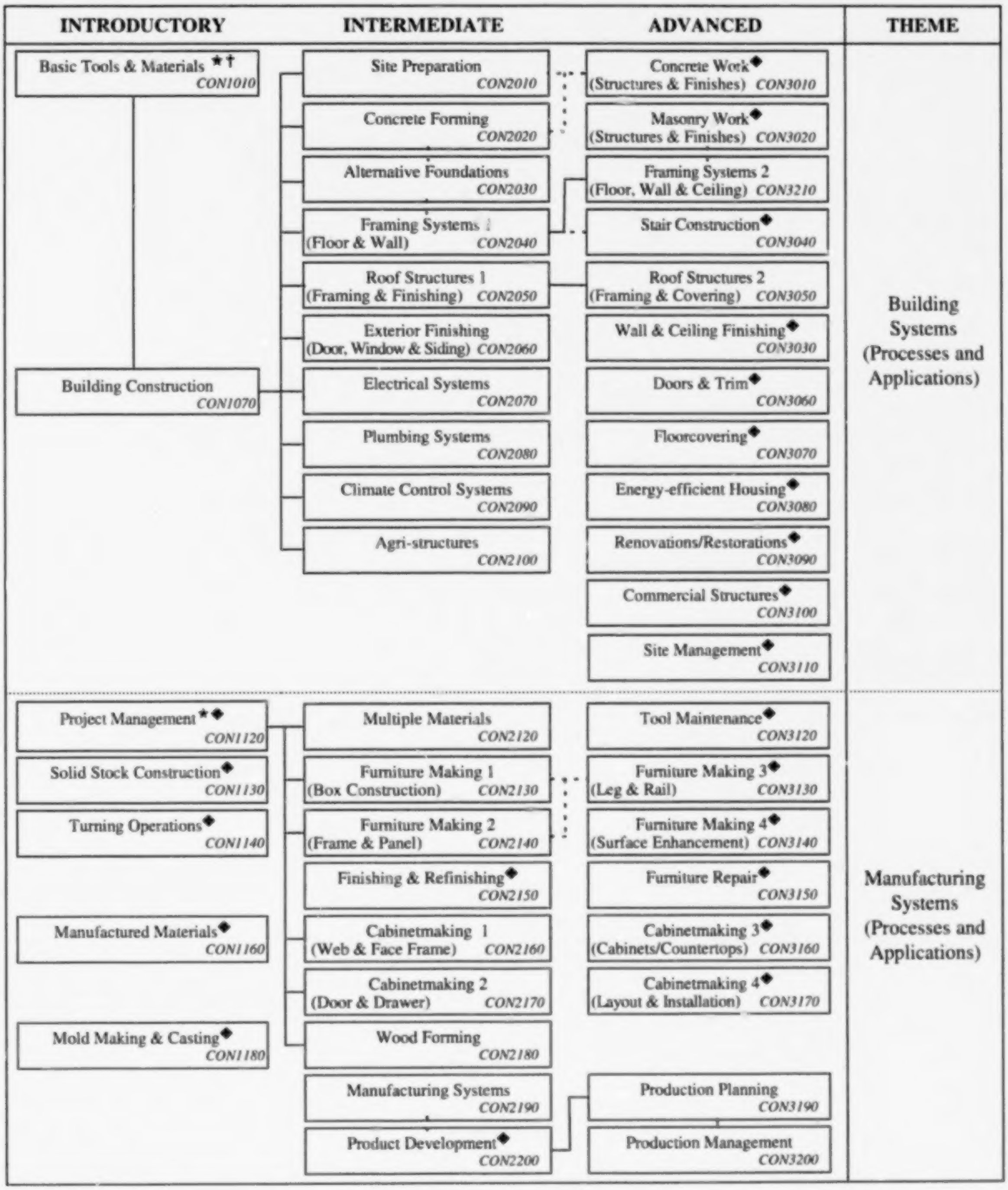
Module CMH3100: Mental Health
Students study the parameters of mental well-being and the causes, signs, symptoms and treatment of mental illness. Students learn coping skills, and identify community support resources.

Module CMH3110: Advances in Medical Technology
Students focus on the social, emotional and economic impact of health technology. Related ethical issues are also examined.

Module CMH3120: First Aid/CPR for Children
Students identify a child-safe environment and recognize life-threatening emergencies or medical conditions, and demonstrate appropriate first-aid procedures.

Module CMH3130: Sports First Aid 2
Students focus on the application of knowledge, skills and techniques to enhance athletic performance, and identify common athletic injuries, therapeutic solutions and rehabilitation strategies.

SCOPE AND SEQUENCE CONSTRUCTION TECHNOLOGIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Basic Tools & Materials ★† CON1010	Site Preparation CON2010	Concrete Work◆ (Structures & Finishes) CON3010	Building Systems (Processes and Applications)
	Concrete Forming CON2020	Masonry Work◆ (Structures & Finishes) CON3020	
	Alternative Foundations CON2030	Framing Systems 2 (Floor, Wall & Ceiling) CON3210	
	Framing Systems 1 (Floor & Wall) CON2040	Stair Construction◆ CON3040	
	Roof Structures 1 (Framing & Finishing) CON2050	Roof Structures 2 (Framing & Covering) CON3050	
	Exterior Finishing (Door, Window & Siding) CON2060	Wall & Ceiling Finishing◆ CON3030	
Building Construction CON1070	Electrical Systems CON2070	Doors & Trim◆ CON3060	
	Plumbing Systems CON2080	Floorcovering◆ CON3070	
	Climate Control Systems CON2090	Energy-efficient Housing◆ CON3080	
	Agri-structures CON2100	Renovations/Restorations◆ CON3090	
		Commercial Structures◆ CON3100	
		Site Management◆ CON3110	
Project Management ★◆ CON1120	Multiple Materials CON2120	Tool Maintenance◆ CON3120	Manufacturing Systems (Processes and Applications)
Solid Stock Construction◆ CON1130	Furniture Making 1 (Box Construction) CON2130	Furniture Making 3◆ (Leg & Rail) CON3130	
Turning Operations◆ CON1140	Furniture Making 2 (Frame & Panel) CON2140	Furniture Making 4◆ (Surface Enhancement) CON3140	
	Finishing & Refinishing◆ CON2150	Furniture Repair◆ CON3150	
Manufactured Materials◆ CON1160	Cabinetmaking 1 (Web & Face Frame) CON2160	Cabinetmaking 3◆ (Cabinets/Countertops) CON3160	
	Cabinetmaking 2 (Door & Drawer) CON2170	Cabinetmaking 4◆ (Layout & Installation) CON3170	
Mold Making & Casting◆ CON1180	Wood Forming CON2180		
	Manufacturing Systems CON2190	Production Planning CON3190	
	Product Development◆ CON2200	Production Management CON3200	

——— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
† Module is also offered in Fabrication Studies.
◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module CFS1010: Basic Tools & Materials
Students develop basic hand tool and production skills to transform, safely, common building materials into useful products.

Module CON1070: Building Construction
Students examine common building systems, and develop basic skills related to building a simple model or full size system/structure.

Module CON1120: Project Management
Students develop basic shop drawing and estimating skills, and apply them to build a product.

Module CON1130: Solid Stock Construction
Students develop basic hand and power tool skills to build a product made from solid wood.

Module CON1140: Turning Operations
Students use wood-turning equipment and techniques to create a faceplate and spindle turning made from solid and/or built-up stock.

Module CON1160: Manufactured Materials
Students select and use the appropriate materials and tools to build a product or structure from a wood composite or other manufactured material.

Module CON1180: Mold Making & Casting
Students apply knowledge of casting and molding materials and processes to prepare a mold and produce a casting.

Module CON2010: Site Preparation
Students develop the knowledge and skills to acquire a building permit and to locate and prepare a site for excavation and foundation work.

Module CON2020: Concrete Forming
Students develop knowledge and skills related to the preparation and construction of a concrete foundation.

Module CON2030: Alternative Foundations
Students develop basic knowledge and skills related to the design and construction of an alternative foundation system.

Module CON2040: Framing Systems 1 (Floor & Wall)
Students develop basic framing knowledge and skills associated with the construction of a floor and wall system.

Module CON2050: Roof Structures 1 (Framing & Finishing)
Students develop basic knowledge and skills associated with framing and finishing a simple roof system.

Module CON2060: Exterior Finishing (Door, Window & Siding)
Students apply and develop basic knowledge of door, window and siding systems and installation skills and procedures.

Module CON2070: Electrical Systems
Students apply electrical principles, and develop an understanding of residential electrical code requirements and installation procedures.

Module CON2080: Plumbing Systems
Students develop basic knowledge and skills to fabricate and make repairs to residential drainage, waste, vent (DWV) and water supply systems.

Module CON2090: Climate Control Systems
Students investigate common heating, ventilating and air conditioning (HVAC) systems and principles, and participate in the installation or maintenance of one of these systems.

Module CON2100: Agri-structures
Students apply construction principles and skills, and use pre-engineered designs to build a structure to be used for agricultural purposes.

Module CON2120: Multiple Materials
Students develop a product that incorporates two or more types of material in its construction.

Module CON2130: Furniture Making 1 (Box Construction)
Students develop basic joinery skills and knowledge related to case construction, by producing a box-type piece of furniture.

Module CON2140: Furniture Making 2 (Frame & Panel)
Students use solid and/or composite materials to build a frame and panel product or component.

Module CON2150: Finishing & Refinishing
Students use knowledge of finishing materials and finishing techniques to apply new and replacement finishes.

Module CON2160: Cabinetmaking 1 (Web & Face Frame)
Students apply web and face frame construction techniques, and use solid and/or manufactured materials to produce a built-in or modular cabinet.

Module CON2170: Cabinetmaking 2 (Door & Drawer)
Students use solid and composite materials to develop skills in building cabinet doors and drawers.

Module CON2180: Wood Forming
Students apply skills in mold making and wood conditioning to make a formed part or component.

Module CON2190: Manufacturing Systems
Students investigate the nature of manufacturing systems used to produce durable goods.

Module CON2200: Product Development
Students work, individually or as team members, to research, design and build a product suitable for mass production and marketing.

Module CON3010: Concrete Work (Structures & Finishes)
Students develop essential skills to form, place and finish a concrete project.

Module CON3020: Masonry Work (Structures & Finishes)
Students develop basic knowledge and skills related to masonry materials, structures and finishes.

Module CON3030: Wall & Ceiling Finishing
Students develop basic knowledge and skills to insulate, install and finish an interior wall/ceiling surface.

Module CON3040: Stair Construction
Students develop the knowledge and skills required to build a straight flight of stairs.

Module CON3050: Roof Structures 2 (Framing & Covering)
Students develop basic competencies in laying out, cutting and assembling common and hip and valley rafters in relation to specialized structures and coverings.

Module CON3060: Doors & Trim
Students apply basic finish carpentry knowledge and skills to install doors, railings and moldings.

Module CON3070: Floorcovering
Students develop skills in selecting and installing typical floor coverings used in residential, institutional and commercial buildings.

Module CON3080: Energy-Efficient Housing
Students investigate construction practices and support systems to create an energy-efficient housing design.

Module CON3090: Renovations/Restorations
Students work with a client to plan and complete a building renovation and/or restoration.

Module CON3100: Commercial Structures
Students investigate structural designs, construction techniques and work site practices related to commercial construction.

Module CON3110: Site Management
Students consider the efficient and timely delivery of a quality product. They investigate and report on site management theories and practices to produce a project management plan.

Module CON3120: Tool Maintenance
Students develop skills in preventive maintenance by routinely inspecting and servicing production tools and equipment.

Module CON3130: Furniture Making 3 (Leg & Rail)
Students use solid and/or manufactured materials and leg-and-rail or pedestal construction techniques to build a free-standing piece of furniture.

Module CON3140: Furniture Making 4 (Surface Enhancement)
Students explore and demonstrate the use of veneer, inlay, carving and/or marquetry techniques to enhance the appearance of a product or component.

Module CON3150: Furniture Repair
Students apply basic knowledge of furniture construction and materials to repair or replace existing components or coverings.

Module CON3160: Cabinetmaking 3 (Cabinet/Countertops)
Students develop the knowledge and skills required to build and install a simple cabinet/countertop complete with an appropriate backsplash and edge treatment.

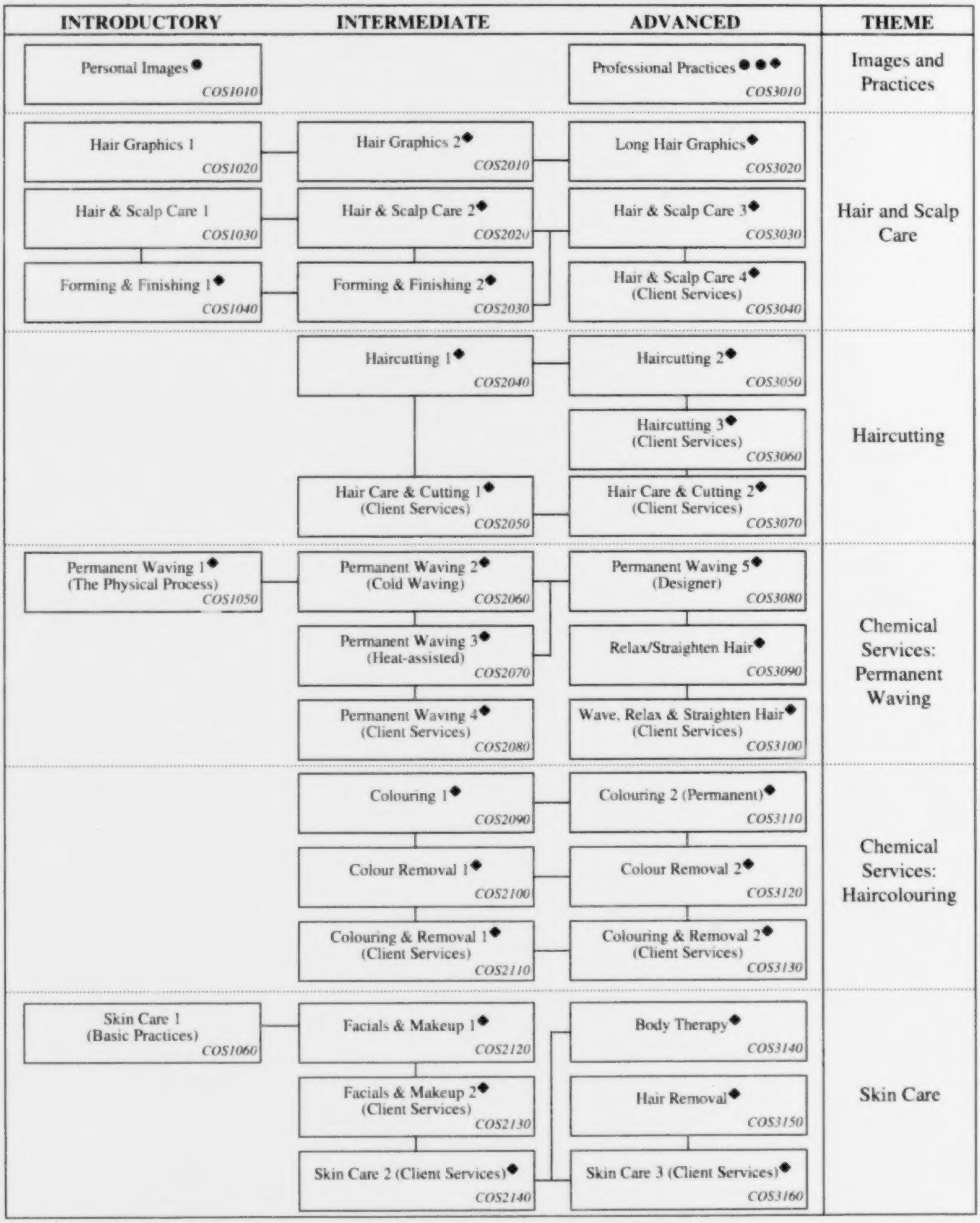
Module CON3170: Cabinetmaking 4 (Layout & Installation)
Students develop a floor/wall cabinet plan and order and install a set of prebuilt cabinets.

Module CON3190: Production Planning
Students plan, individually or as team members, a production system, and create the necessary work cells and floor plan to produce a given product in a safe and efficient manner.

Module CON3200: Production Management
Students identify and enhance management skills in relation to the development and deployment of people and physical resources.

Module CON3210: Framing Systems 2 (Floor, Wall & Ceiling)
Students develop appropriate layout and assembly skills to install conventional and/or engineered framing components associated with residential and/or light commercial construction.

SCOPE AND SEQUENCE COSMETOLOGY STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Personal Images ● *COS1010*		Professional Practices ●●◆ *COS3010*	Images and Practices
Hair Graphics 1 *COS1020*	Hair Graphics 2◆ *COS2010*	Long Hair Graphics◆ *COS3020*	Hair and Scalp Care
Hair & Scalp Care 1 *COS1030*	Hair & Scalp Care 2◆ *COS2020*	Hair & Scalp Care 3◆ *COS3030*	
Forming & Finishing 1◆ *COS1040*	Forming & Finishing 2◆ *COS2030*	Hair & Scalp Care 4◆ (Client Services) *COS3040*	
	Haircutting 1◆ *COS2040*	Haircutting 2◆ *COS3050*	Haircutting
		Haircutting 3◆ (Client Services) *COS3060*	
	Hair Care & Cutting 1◆ (Client Services) *COS2050*	Hair Care & Cutting 2◆ (Client Services) *COS3070*	
Permanent Waving 1◆ (The Physical Process) *COS1050*	Permanent Waving 2◆ (Cold Waving) *COS2060*	Permanent Waving 5◆ (Designer) *COS3080*	Chemical Services: Permanent Waving
	Permanent Waving 3◆ (Heat-assisted) *COS2070*	Relax/Straighten Hair◆ *COS3090*	
	Permanent Waving 4◆ (Client Services) *COS2080*	Wave, Relax & Straighten Hair◆ (Client Services) *COS3100*	
	Colouring 1◆ *COS2090*	Colouring 2 (Permanent)◆ *COS3110*	Chemical Services: Haircolouring
	Colour Removal 1◆ *COS2100*	Colour Removal 2◆ *COS3120*	
	Colouring & Removal 1◆ (Client Services) *COS2110*	Colouring & Removal 2◆ (Client Services) *COS3130*	
Skin Care 1 (Basic Practices) *COS1060*	Facials & Makeup 1◆ *COS2120*	Body Therapy◆ *COS3140*	Skin Care
	Facials & Makeup 2◆ (Client Services) *COS2130*	Hair Removal◆ *COS3150*	
	Skin Care 2 (Client Services)◆ *COS2140*	Skin Care 3 (Client Services)◆ *COS3160*	

——— Prerequisite - - - - Recommended sequence

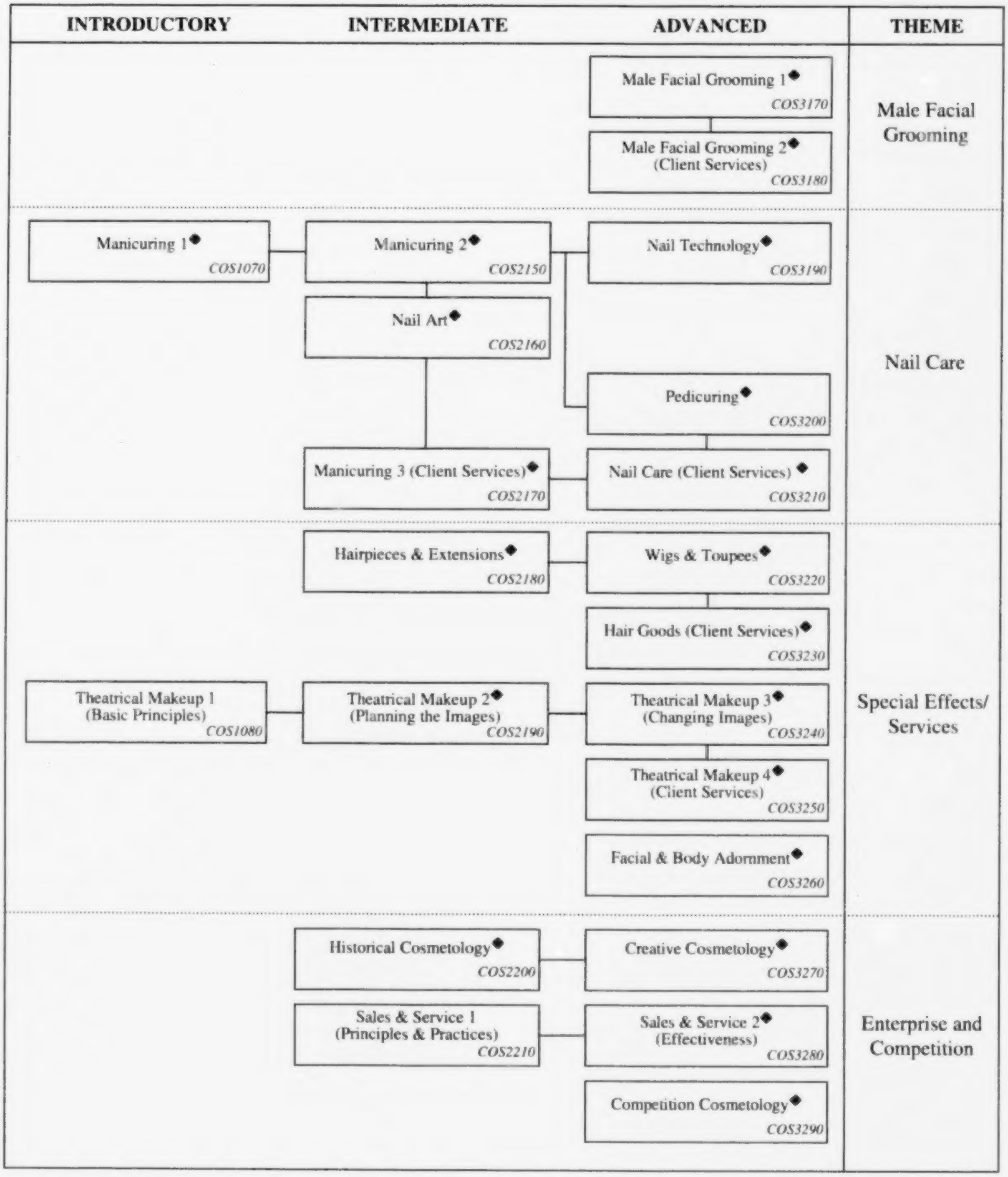
● Prerequisite to all introductory modules in this strand.

●● Prerequisite to all advanced modules in this strand.

◆ Refer to specific modules for additional prerequisites.

SCOPE AND SEQUENCE (continued)

COSMETOLOGY STUDIES


INTRODUCTORY
INTERMEDIATE
ADVANCED
THEME
Male Facial Grooming 1◆ COS3170
Male Facial Grooming 2◆ (Client Services) COS3180
Male Facial Grooming
Manicuring 1◆ COS1070
Manicuring 2◆ COS2150
Nail Technology◆ COS3190
Nail Art◆ COS2160
Pedicuring◆ COS3200
Manicuring 3 (Client Services)◆ COS2170
Nail Care (Client Services)◆ COS3210
Nail Care
Hairpieces & Extensions◆ COS2180
Wigs & Toupees◆ COS3220
Hair Goods (Client Services)◆ COS3230
Theatrical Makeup 1 (Basic Principles) COS1080
Theatrical Makeup 2◆ (Planning the Images) COS2190
Theatrical Makeup 3◆ (Changing Images) COS3240
Theatrical Makeup 4◆ (Client Services) COS3250
Facial & Body Adornment◆ COS3260
Special Effects/ Services
Historical Cosmetology◆ COS2200
Creative Cosmetology◆ COS3270
Sales & Service 1 (Principles & Practices) COS2210
Sales & Service 2◆ (Effectiveness) COS3280
Competition Cosmetology◆ COS3290
Enterprise and Competition

——— Prerequisite - - - - Recommended sequence

◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module COS1010: Personal Images
Students develop increased appreciation for the significance of personal grooming in various life situations, as well as the knowledge and skills required to perform basic grooming practices.

Module COS1020: Hair Graphics 1
Students handle hair confidently; brush, comb and part hair correctly; and create ropes, knots and two- or three-strand braids.

Module COS1030: Hair & Scalp Care 1
Students analyze and describe the structure and condition of hair and scalp, as well as identify and use basic cleansing and surface conditioning products.

Module COS1040: Forming & Finishing 1
Students wave, curl and style hair, using a variety of equipment, tools and supply items.

Module COS1050: Permanent Waving 1 (The Physical Process)
Students section, block and wind hair for a basic permanent wave, using conventional waving rods and supplies.

Module COS1060: Skin Care 1 (Basic Practices)
Students identify the basic structures and functions of the skin, analyze skin and perform basic skin care practices, including cleansing, toning, nourishing and protecting.

Module COS1070: Manicuring 1
Students identify the functions, shapes and basic structure of fingernails, conditions of hands and fingernails, and perform a plain manicure.

Module COS1080: Theatrical Makeup 1 (Basic Principles)
Students describe the purpose and scope of theatrical makeup, identify elements related to designing theatrical makeup, and use appropriate materials to perform basic theatrical makeup techniques.

Module COS2010: Hair Graphics 2
Students use photo or other images as guides to recreate a variety of ropes, braids, knots, rolls and twists to produce finished hairstyles.

Module COS2020: Hair & Scalp Care 2
Students analyze the histology and condition of hair and the relationship of hair to the scalp, and select and use appropriate hair and scalp cleansing and conditioning products.

Module COS2030: Forming & Finishing 2
Students analyze head and facial features, determine suitable hairstyles, and form and finish hairstyles.

Module COS2040: Haircutting 1
Students demonstrate safe handling of haircutting and hairthinning tools, and describe and demonstrate basic cutting methods.

Module COS2050: Hair Care & Cutting 1 (Client Services)
Students analyze a client's need for hair and scalp care and perform the necessary services.

Module COS2060: Permanent Waving 2 (Cold Waving)
Students identify types of chemicals used to permanently wave hair and the relationship between the chemical process and the physical process. Students also analyze hair and combine the two processes to perform complete cold waves.

Module COS2070: Permanent Waving 3 (Heat-assisted)
Students use appropriate physical and chemical processes and products to perform heat-assisted permanent waves, and analyze the quality of the waves.

Module COS2080: Permanent Waving 4 (Client Services)
Students analyze the condition of hair, identify and describe available types of permanent waves, and recommend and perform permanent waving services appropriate to the client's needs and wants.

Module COS2090: Colouring 1
Students describe the basic principles of colour and haircolouring, describe and perform patch/ predisposition and strand tests, and prepare and apply temporary and semipermanent haircolours.

Module COS2100: Colour Removal 1
Students describe the basic principles of colour removal, levels of colour, colour removal chemicals and application procedures, and prepare and apply a variety of products to remove natural and artificial haircolour.

Module COS2110: Colouring & Removal 1 (Client Services)
Students analyze the condition of a client's hair and scalp, and prepare for and perform colouring and colour removal services.

Module COS2120: Facials & Makeup 1
Students describe the anatomy, physiology and histology of the skin and the effect of pathogenic organisms on the body. Students also analyze facial shapes and conditions, and perform facial care and corrective makeup techniques.

Module COS2130: Facials & Makeup 2 (Client Services)
Students consult with and analyze a client's skin care needs, and perform a variety of facial services, including surface cleansing and corrective makeup techniques.

Module COS2140: Skin Care 2 (Client Services)
Students consult with and analyze the client's skin care needs, and recommend and perform client-approved services, including cleansing, toning (manual and electrical massage), nourishing and protecting.

Module COS2150: Manicuring 2
Students describe the anatomy of the arm and hand, identify diseases and disorders of the hands and nails and hand and nail conditions that may be treated by a manicurist, and recommend and perform services for treatable conditions.

Module COS2160: Nail Art
Students describe nail art techniques used to enhance the appearance of fingernails, as well as design and produce simple nail art.

Module COS2170: Manicuring 3 (Client Services)
Students analyze hands and nails to determine manicure needs and the presence of treatable and nontreatable conditions, as well as select and perform appropriate manicure and related services.

Module COS2180: Hairpieces & Extensions
Students describe the purpose of hairpieces and extensions and types of hair and fibres used in constructing hair goods, and analyze and service hair goods.

Module COS2190: Theatrical Makeup 2 (Planning the Images)
Students design, select and apply makeup to create images of selected characters and to enhance personal appearances for theatrical purposes.

Module COS2200: Historical Cosmetology
Students, in addition to recreating historical hairstyles and facial images, describe the historical trends in hairstyles and makeup, and the relationship between historical changes in cosmetology to other changes in society.

Module COS2210: Sales & Service 1 (Principles & Practices)
Students describe and demonstrate basic principles of selling and service in the various sectors of the cosmetology industry.

Module COS3010: Professional Practices
Students describe the sectors of the cosmetology industry, as well as current and projected trends, needs, career opportunities, trade ethics and qualifications required for entry into each sector.

Module COS3020: Long Hair Graphics
Students design and produce symmetrical and asymmetrical hairstyles to create long hair graphics.

Module COS3030: Hair & Scalp Care 3
Students analyze the condition of the hair and scalp, make treatment decisions and recommendations, and clean and condition the hair and scalp, using available technology.

Module COS3040: Hair & Scalp Care 4 (Client Services)
Students analyze a client's hair and scalp, make treatment decisions and recommend services, and perform client-approved hair and scalp care services to a client's satisfaction.

Module COS3050: Haircutting 2
Students demonstrate the ability to design and follow cutting patterns, and safely use haircutting and thinning shears, razors and electric clippers.

Module COS3060: Haircutting 3 (Client Services)
Students analyze hair, scalp, face, haircuts and styles, recommend hairstyles, prepare clients and perform haircutting services.

Module COS3070: Hair Care & Cutting 2 (Client Services)
Students consult with the client to determine services desired, analyze a client's hair and scalp, face and facial features, and recommend and perform client-approved services and treatments to create finished hairstyles.

Module COS3080: Permanent Waving 5 (Designer)
Students identify and describe designer techniques, processes and implements used to permanently wave hair, complete a chemical process for each designer technique, and describe the advantages and disadvantages of each technique.

Module COS3090: Relax/Straighten Hair
Students describe the purposes and products available to physically and chemically relax and straighten hair, and identify, describe and practise safe relaxing and straightening techniques.

Module COS3100: Wave, Relax & Straighten Hair (Client Services)
Students analyze a client's hair and scalp, and recommend appropriate waving, relaxing and straightening services.

Module COS3110: Colouring 2 (Permanent)
Students describe the purposes and principles of permanent haircolouring, identify permanent colouring products, their active ingredients and their effects on the hair and possible effects on the body, and demonstrate skin and strand testing and retouch and whole head colour applications.

Module COS3120: Colour Removal 2
Students analyze the condition of the hair and scalp and the nature of colour in/on hair, and prepare and apply various colour removal products to regrowths and whole heads of hair.

Module COS3130: Colouring & Removal 2 (Client Services)
Students analyze the condition of a client's hair and scalp, consult with the client, and recommend, prepare for, and perform colouring and colour removal services.

Module COS3140: Body Therapy
Students apply available technology to provide therapies (heat, electrical and light), apply principles and practices of body therapy, and apply skin care products to body surfaces.

Module COS3150: Hair Removal
Students describe temporary and permanent hair removal methods, classify each method as a physical, chemical or electrical procedure, and identify and describe safety and sanitary practices for each procedure.

Module COS3160: Skin Care 3 (Client Services)
Students analyze a client's skin and determine skin care needs, consult with the client, and recommend, prepare for, and perform approved skin care services.

Module COS3170: Male Facial Grooming 1
Students describe principles and demonstrate practices for male facial grooming, including basic skin care, shaving, moustache/beard shaping, trimming and waxing, and nasal and aural hair removal.

Module COS3180: Male Facial Grooming 2 (Client Services)
Students analyze a client's face to determine facial grooming needs, consult with the client, and recommend and perform male facial grooming services, as required.

Module COS3190: Nail Technology
Students describe causes of nail breakage and damage, demonstrate techniques used to repair damaged nails and apply artificial nails, and describe effects of artificial/sculptured nails on natural nails.

Module COS3200: Pedicuring
Students describe relationships between a manicure and pedicure, and identify and demonstrate a pedicuring procedure, including foot massage.

Module COS3210: Nail Care (Client Services)
Students analyze client's hands, feet and nails and determine manicure/pedicure needs, consult with the client and recommend services and products to enhance the condition and appearance of nails, and use available technology to perform manicures/pedicures and related services.

Module COS3220: Wigs & Toupees
Students identify the purpose of wigs and toupees, and factors affecting the quality of wigs and toupees, and demonstrate safe and sanitary procedures used to clean, colour, cut, fit, repair and style wigs and toupees, as well as take head measurements and samples.

Module COS3230: Hair Goods (Client Services)
Students analyze hair goods, make decisions relating to services needed, perform client-approved services to hair goods, and take a client's head measurements in preparation for ordering a custom-made hair good.

Module COS3240: Theatrical Makeup 3 (Changing Images)
Students identify materials and describe procedures used to construct and apply two- and three-dimensional makeup and prostheses, analyze images of characters and design, and plan and apply theatrical makeup to recreate images of characters.

Module COS3250: Theatrical Makeup 4 (Client Services)
Students provide a client or client group with the theatrical makeup services to create images that are appropriate to different lighting and portrayal conditions.

Module COS3260: Facial & Body Adornment
Students identify adornments available to enhance or change appearances, describe effects of different adornments, demonstrate safe and sanitary service procedures, and explore alternative forms of body adornment.

Module COS3270: Creative Cosmetology
Students describe current cosmetology-related fashions, fads and trends, and apply design principles to create skin, hair and nail stylings that may become fads or trends.

Module COS3280: Sales & Service 2
Students distinguish between sales and service techniques that encourage positive client responses and those that evoke negative responses, demonstrate effective sales and service techniques, and identify and demonstrate duties performed by salon receptionists.

Module COS3290: Competition Cosmetology
Students identify opportunities to participate in competitions relating to cosmetology, describe the qualities needed to be competitive and the judging systems used at various levels of competitions, and demonstrate ability to be competitive in one or more areas of cosmetology.

RECOMMENDED LINKAGE MODULES IN THE CONTEXT OF COSMETOLOGY STUDIES

See Section H (Linkages/Transitions) for further details on the following modules.

Module DES1020: The Design Process
Students identify the elements of design and basic design processes and creates and/or change body images with the aid of cosmetics and other related materials. See Design Studies Guide to Standards and Implementation.

Module ENT1010: Challenge & Opportunity
Students apply strategies and develop competencies associated with being enterprising and innovative, describe the process and parts of a venture plan, and assess a variety of venture opportunities related to cosmetology. See Enterprise and Innovation Guide to Standards and Implementation.

Module ENT1020: Planning a Venture
Students demonstrate qualities that initiate change, and selects, plans and assess a cosmetology-related venture. See Enterprise and Innovation Guide to Standards and Implementation.

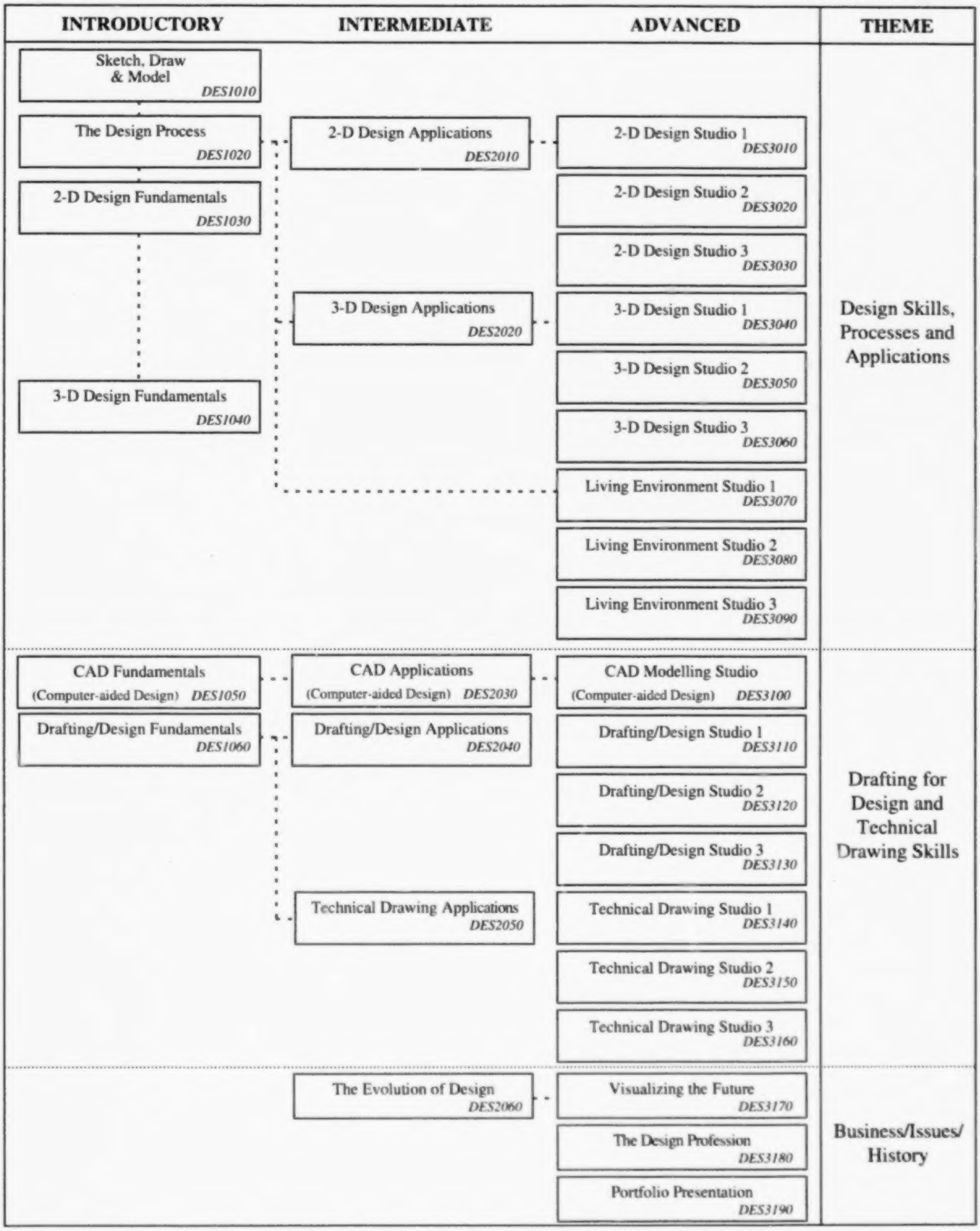
Module ENT2010: Analyzing Ventures
Students describe methods for analyzing and evaluating ventures, examine criteria important to a venture's success in a cosmetology-related area, conduct market research and analyzes data, and use data to assess ventures. See Enterprise and Innovation Guide to Standards and Implementation.

Module ENT2040: Implementing the Venture
Students determine the start-up requirements for a cosmetology-related venture, establish management procedures required to start the venture, and demonstrate leadership qualities in implementing the venture. See Enterprise and Innovation Guide to Standards and Implementation.

Module ENT3010: Managing the Venture
Students manage the cosmetology-related venture by establishing a variety of management procedures, examine critical risks and develop contingency procedures, and monitor the venture plan and revise as necessary. See Enterprise and Innovation Guide to Standards and Implementation.

SCOPE AND SEQUENCE

DESIGN STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Sketch, Draw & Model *DES1010*			Design Skills, Processes and Applications
The Design Process *DES1020*	2-D Design Applications *DES2010*	2-D Design Studio 1 *DES3010*	
2-D Design Fundamentals *DES1030*		2-D Design Studio 2 *DES3020*	
		2-D Design Studio 3 *DES3030*	
	3-D Design Applications *DES2020*	3-D Design Studio 1 *DES3040*	
3-D Design Fundamentals *DES1040*		3-D Design Studio 2 *DES3050*	
		3-D Design Studio 3 *DES3060*	
		Living Environment Studio 1 *DES3070*	
		Living Environment Studio 2 *DES3080*	
		Living Environment Studio 3 *DES3090*	
CAD Fundamentals (Computer-aided Design) *DES1050*	CAD Applications (Computer-aided Design) *DES2030*	CAD Modelling Studio (Computer-aided Design) *DES3100*	Drafting for Design and Technical Drawing Skills
Drafting/Design Fundamentals *DES1060*	Drafting/Design Applications *DES2040*	Drafting/Design Studio 1 *DES3110*	
		Drafting/Design Studio 2 *DES3120*	
		Drafting/Design Studio 3 *DES3130*	
	Technical Drawing Applications *DES2050*	Technical Drawing Studio 1 *DES3140*	
		Technical Drawing Studio 2 *DES3150*	
		Technical Drawing Studio 3 *DES3160*	
	The Evolution of Design *DES2060*	Visualizing the Future *DES3170*	Business/Issues/ History
		The Design Profession *DES3180*	
		Portfolio Presentation *DES3190*	

——— Prerequisite . . . . Recommended sequence

MODULE DESCRIPTIONS

Module DES1010: Sketch, Draw & Model

Students are introduced to observational sketching and drawing, and modelling, and to a selection of materials and tools and their uses. Students also develop skills that can be used and enhanced in further design activity.

Module DES1020: The Design Process

Students begin this process-based activity by developing an understanding of the problem through research. They then develop possible solutions, working through them to arrive at a final, appropriate solution.

Module DES1030: 2-D Design Fundamentals

Students develop skills and techniques appropriate to two-dimensional design by engaging in a variety of activities in various contexts. Techniques may include drawing, layout, use of tools and equipment appropriate for two-dimensional design, cutting, joining, measuring and use of notations.

Module DES1040: 3-D Design Fundamentals

Students develop skills and techniques appropriate to three-dimensional design, by engaging in a variety of activities in various contexts. Techniques may include drawing, modelling, use of tools and equipment appropriate to three-dimensional design, cutting, joining, measuring and use of notations.

Module DES1050: CAD Fundamentals (Computer-aided Design)

Students develop basic knowledge and skills in computer-aided design (CAD).

Module DES1060: Drafting/Design Fundamentals

Students develop basic knowledge, skills and techniques to draft appropriate drawings for visualizing and illustrating simple design problems.

Module DES2010: 2-D Design Applications

Students apply the design process and other knowledge, skills and processes learned at the introductory level to two-dimensional design projects. Projects in this module typically deal with communication problems and issues. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module DES2020: 3-D Design Applications

Students apply the design process and other knowledge, skills and processes learned at the introductory level to three-dimensional design projects. Projects in this module typically deal with problems and issues related to product design. Students take greater responsibility for managing their learning and learn to work cooperatively with others.

Module DES2030: CAD Applications (Computer-aided Design)

Students apply their previous learnings, and add knowledge, skills and techniques associated with computer-aided design (CAD) to the context of new design-related tasks.

Module DES2040: Drafting/Design Applications

Students learn skills in assembly, section and/or auxiliary drawing. They further develop the knowledge, skills and techniques; e.g., pictorial drawings, multiview drawings, surface developments (flat patterns), and by applying them in the context of more complex design projects.

Module DES2050: Technical Drawing Applications

Students develop accurate multiview drawings from previously produced sketches, and learn the common understandings, conventions and language associated with technical drawing.

Module DES2060: The Evolution of Design

Students develop a historical framework for the importance and relevance of design within a cultural context, by examining past and contemporary examples of designed artifacts.

Module DES3010: 2-D Design Studio 1
Students apply theories, skills and techniques of organization of the visual image onto the two-dimensional format, to resolve complex design problems. Emphasis is placed on exploring form, composition and aesthetics of communication design solutions.

Module DES3020: 2-D Design Studio 2
Students investigate the impact, importance and influence of two-dimensional design within a cultural context and the social responsibility of the designer, and apply this information when resolving complex communication design problems.

Module DES3030: 2-D Design Studio 3
Students explore the production processes of two-dimensional design and the role of the designer as an organizer of appropriate materials, processes and systems. This understanding is applied in the resolution of complex two-dimensional design problems.

Module DES3040: 3-D Design Studio 1
Students deal with such aspects as shaping, massing, proportion, scale, contrast, colour, texture and finish within the context of complex three-dimensional design projects.

Module DES3050: 3-D Design Studio 2
Students are introduced to human factors, principles and considerations; e.g., ergonomics, semantics and semiotics.

Module DES3060: 3-D Design Studio 3
Students expand their knowledge of materials, technologies and production/processes employed to shape and join materials and assemble products. Students will become familiar with principles of manufacturing, and materials, technologies and processes appropriate to manufacturing a product in various production quantities.

Module DES3070: Living Environment Studio 1
Students learn to develop appropriate architectural, environmental or interior design solutions for specific human needs. Students also learn to use design methodology and teamwork in the development of such solutions.

Module DES3080: Living Environment Studio 2
Students learn to consider form and space when developing specific architectural, environmental or interior design solutions specific to human and/or environmental needs. They assess solutions on the basis of functional and aesthetic considerations and appropriateness within the human environment. Materials and production processes may be considered at this stage though not necessarily resolved. When designing at the micro level, students consider the ergonomic aspects of design.

Module DES3090: Living Environment Studio 3
Students develop design solutions specific to architectural, environmental or interior design and learn about using and/or specifying appropriate materials and production processes.

Module DES3100: CAD Modelling Studio (Computer-aided Design)
Students solve design problems, using advanced computer-aided design (CAD) methods, advanced commands, three-dimensional modelling techniques, rendering, shading and animation techniques.

Module DES3110: Drafting/Design Studio 1
Students concentrate on various drawing and drafting types to illustrate design concepts and solutions, including freehand drawings, illustrative views, isometric drawings, perspective drawings, axiometric drawings, surface developments (flat pattern). This is a skill-building module with the emphasis on line drawing.

Module DES3120: Drafting/Design Studio 2
Students develop complex explanatory drawings from base (line) drawings, that may include exploded views, cut-aways, revolutions, sectional, and shadow and reflection construction. This is a skill-building module with the emphasis on explanatory line drawings.

Module DES3130: Drafting/Design Studio 3

Students apply rendering techniques to line drawings (base or developed), concentrating on light, colour and various media; e.g., coloured pencils, marker pens, water colours, computer rendered. Presentation techniques are used to compose high quality illustrations to communicate design solution, such as rendered drawings, context backgrounds, collage and montage techniques, titles, text.

Module DES3140: Technical Drawing Studio 1

Students produce sections, elevations and auxiliary drawings, and build upon their learnings from the intermediate level. Students may use previously produced sketches and multiview drawings as a basis for further work.

Module DES3150: Technical Drawing Studio 2

Students identify and specify details of various product components with a focus on representations of developments; e.g., sheet metal flashing, clothing patterns, and on intersections; e.g., the intersection of two heating ducts.

Module DES3160: Technical Drawing Studio 3

Students diagram and illustrate the design specifications for a product, structure and/or process as a basis for fabrication, manufacturing and/or construction. They complete a set of working drawings for a self-generated or teacher-specified designed item.

Module DES3170: Visualizing the Future

Students explore new possibilities in design, including the role of the designer and the challenges that are faced by the designers.

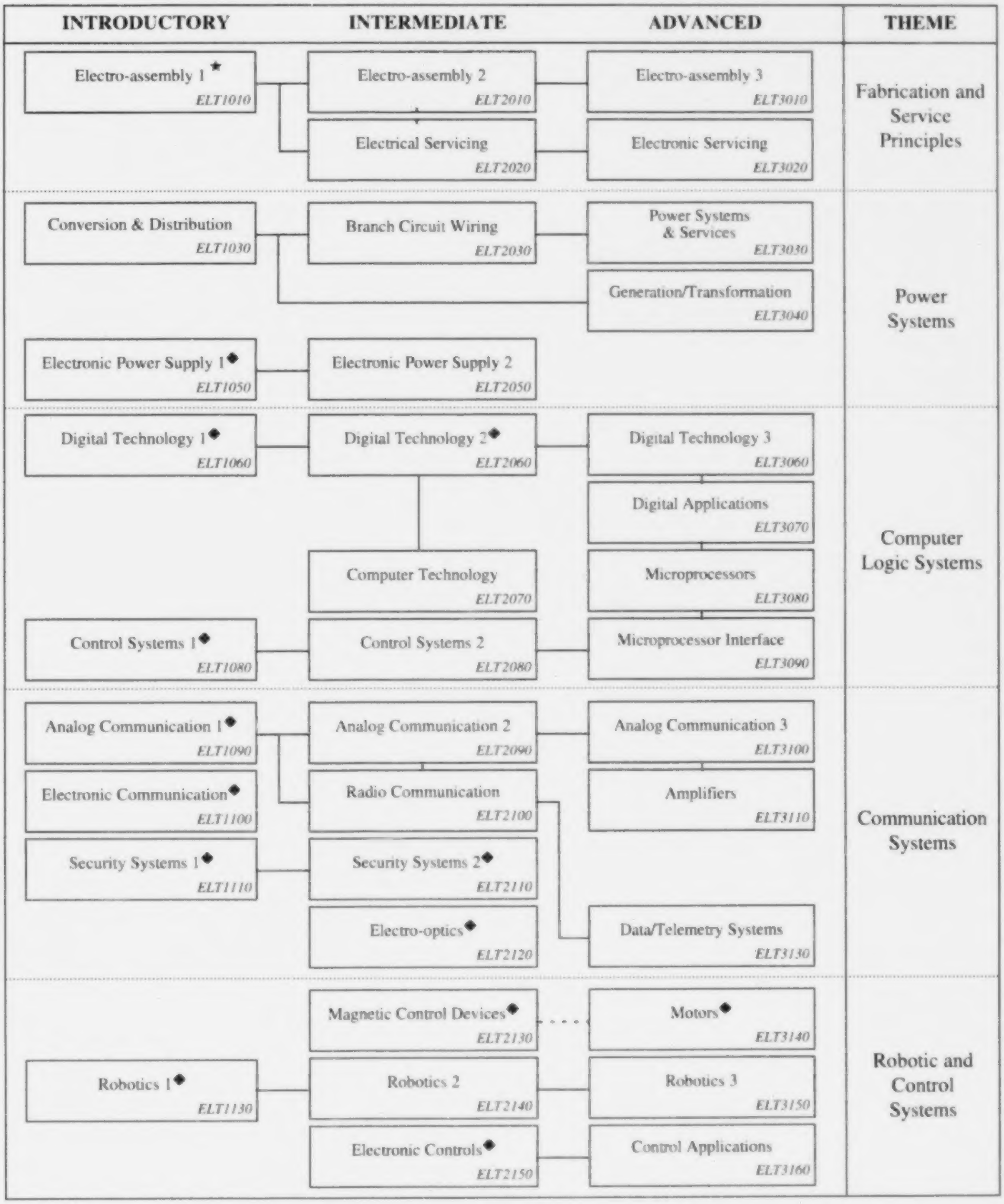
Module DES3180: The Design Profession

Students develop an understanding of the business aspect of the design profession, including educational qualifications, opportunities in design and some of the issues and challenges designers face. Ethical, legal and social issues may also be explored.

Module DES3190: Portfolio Presentation

Students prepare a presentation portfolio for a specific purpose, such as entry into the workplace or a post-secondary institution.

SCOPE AND SEQUENCE ELECTRO-TECHNOLOGIES


INTRODUCTORY
INTERMEDIATE
ADVANCED
THEME
Electro-assembly 1★ ELT1010
Electro-assembly 2 ELT2010
Electro-assembly 3 ELT3010
Electrical Servicing ELT2020
Electronic Servicing ELT3020
Fabrication and Service Principles
Conversion & Distribution ELT1030
Branch Circuit Wiring ELT2030
Power Systems & Services ELT3030
Generation/Transformation ELT3040
Electronic Power Supply 1◆ ELT1050
Electronic Power Supply 2 ELT2050
Power Systems
Digital Technology 1◆ ELT1060
Digital Technology 2◆ ELT2060
Digital Technology 3 ELT3060
Digital Applications ELT3070
Computer Technology ELT2070
Microprocessors ELT3080
Control Systems 1◆ ELT1080
Control Systems 2 ELT2080
Microprocessor Interface ELT3090
Computer Logic Systems
Analog Communication 1◆ ELT1090
Analog Communication 2 ELT2090
Analog Communication 3 ELT3100
Electronic Communication◆ ELT1100
Radio Communication ELT2100
Amplifiers ELT3110
Security Systems 1◆ ELT1110
Security Systems 2◆ ELT2110
Electro-optics◆ ELT2120
Data/Telemetry Systems ELT3130
Communication Systems
Magnetic Control Devices◆ ELT2130
Motors◆ ELT3140
Robotics 1◆ ELT1130
Robotics 2 ELT2140
Robotics 3 ELT3150
Electronic Controls◆ ELT2150
Control Applications ELT3160
Robotic and Control Systems

——— Prerequisite - - - - Recommended sequence

★Module provides a strong foundation for further learning in this strand.

◆Refer to specific modules for additional prerequisites

MODULE DESCRIPTIONS

Module ELT1010: Electro-assembly 1
Students apply basic fabricating and servicing techniques to construct and test electronic and electromagnetic devices and cables.

Module ELT1030: Conversion & Distribution
Students experiment and work with principles of electrical energy conversion and distribution.

Module ELT1050: Electronic Power Supply 1
Students construct different types of alternating and direct current power supplies, and demonstrate their application in electrical/electronic systems.

Module ELT1060: Digital Technology 1
Students construct and demonstrate logic systems and their unique functions.

Module ELT1080: Control Systems 1
Students construct process control systems, demonstrate their basic operation, and demonstrate procedures for testing them.

Module ELT1090: Analog Communication 1
Students install and demonstrate the fundamentals of various consumer audio integrated systems.

Module ELT1100: Electronic Communication
Students demonstrate the fundamentals of video systems, and describe their uses.

Module ELT1110: Security Systems 1
Students install and demonstrate the fundamentals of sensors, control units and warning devices used in security systems.

Module ELT1130: Robotics 1
Students apply the fundamentals of robotic systems and basic robotic functions.

Module ELT2010: Electro-assembly 2
Students apply electro-assembly technology to manufacture circuit boards.

Module ELT2020: Electrical Servicing
Students demonstrate the fundamental concepts of repairing, servicing and maintaining electrical and electronic equipment.

Module ELT2030: Branch Circuit Wiring
Students demonstrate the fundamentals of branch circuit wiring used in residential/commercial buildings.

Module ELT2050: Electronic Power Supply 2
Students construct and demonstrate the fundamentals of electronic power supply technology.

Module ELT2060: Digital Technology 2
Students demonstrate knowledge of digital principles, by using small-scale transistor–transistor logic (TTL) and complementary metal oxide semiconductor (CMOS) integrated technology.

Module ELT2070: Computer Technology
Students develop the knowledge and skills required to install and configure a disc operating system and to set up a computer network.

Module ELT2080: Control Systems 2
Students demonstrate how process control technology is used in real-world applications.

Module ELT2090: Analog Communication 2
Students demonstrate the fundamental concepts of electronic analog communication systems.

Module ELT2100: Radio Communication
Students demonstrate the fundamental concepts of electromagnetic communication systems.

Module ELT2110: Security Systems 2
Students demonstrate the fundamentals of security technology used in homes, businesses and transportation systems.

Module ELT2120: Electro Optics
Students demonstrate basic knowledge of lasers and other light wave communication applications in various electronic systems.

Module ELT2130: Magnetic Control Devices
Students demonstrate the fundamentals of electromagnetic control devices.

Module ELT2140: Robotics 2
Students demonstrate the fundamental concepts of sensor devices and control systems, by building an electronic circuit to control a direct wire or mobile robot.

Module ELT2150: Electronic Controls
Students demonstrate the fundamentals of ladder/relay logic programming, and demonstrate how the program's logic controller system operates.

Module ELT3010: Electro-assembly 3
Students apply photographic processes to construct a printed circuit for an electronic project.

Module ELT3020: Electronic Servicing
Students develop and apply basic processes and skills to service and repair consumer-based electronic products.

Module ELT3030: Power Systems & Services
Students construct, operate, analyze and evaluate various single-phase and three-phase power systems and services.

Module ELT3040: Generation/Transformation
Students operate, experiment with and analyze alternators and transformers used in power generation and distribution.

Module ELT3060: Digital Technology 3
Students demonstrate knowledge of digital principles by using medium-scale transistor–transistor logic (TTL) and complementary metal oxide semiconductor (CMOS) integrated technology.

Module ELT3070: Digital Applications
Students experiment with large-scale and very large-scale integrated circuits, and demonstrate their applications to practical situations.

Module ELT3080: Microprocessors
Students compare the internal architecture of microprocessors and program them, using instruction sets.

Module ELT3090: Microprocessor Interface
Students demonstrate how to interface microprocessors/microcontrollers with real-world applications.

Module ELT3100: Analog Communication 3
Students demonstrate the principal concepts of electronic analog communication systems.

Module ELT3110: Amplifiers
Students demonstrate knowledge of various types and classes of amplifiers.

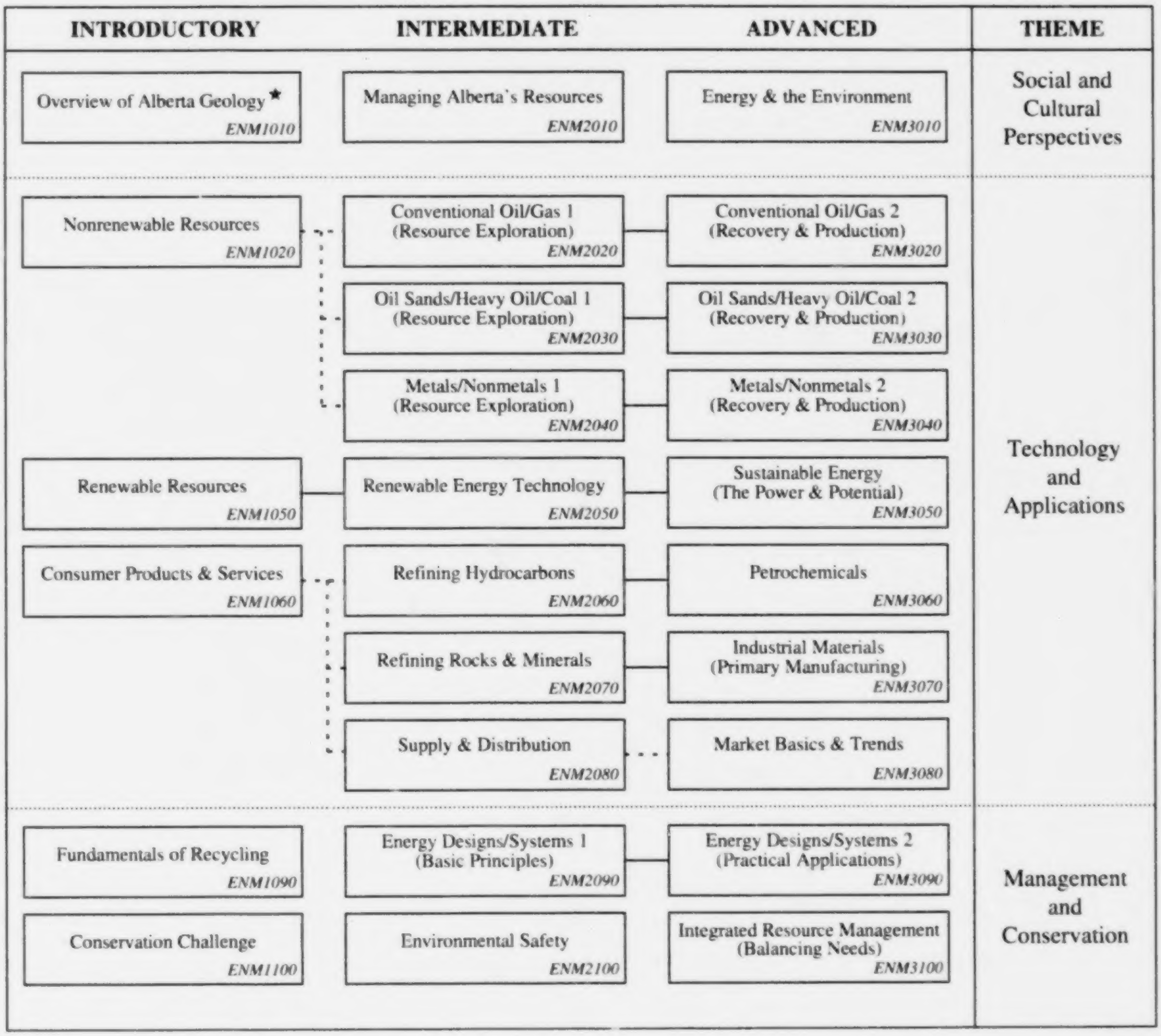
Module ELT3130: Data/Telemetry Systems
Students demonstrate the fundamentals of various data/telemetry systems, and demonstrate their applications to the real world.

Module ELT3140: Motors
Students demonstrate knowledge of electric motor operation and loading characteristics.

Module ELT3150: Robotics 3
Students demonstrate remote/autonomous control systems, by constructing circuits to control robotic behaviour.

Module ELT3160: Control Applications
Students demonstrate the fundamentals of programmed controls, and demonstrate how sensing devices are integrated to control output devices.

SCOPE AND SEQUENCE ENERGY AND MINES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Overview of Alberta Geology ★ *ENM1010*	Managing Alberta's Resources *ENM2010*	Energy & the Environment *ENM3010*	Social and Cultural Perspectives
Nonrenewable Resources *ENM1020*	Conventional Oil/Gas 1 (Resource Exploration) *ENM2020*	Conventional Oil/Gas 2 (Recovery & Production) *ENM3020*	Technology and Applications
	Oil Sands/Heavy Oil/Coal 1 (Resource Exploration) *ENM2030*	Oil Sands/Heavy Oil/Coal 2 (Recovery & Production) *ENM3030*	
	Metals/Nonmetals 1 (Resource Exploration) *ENM2040*	Metals/Nonmetals 2 (Recovery & Production) *ENM3040*	
Renewable Resources *ENM1050*	Renewable Energy Technology *ENM2050*	Sustainable Energy (The Power & Potential) *ENM3050*	
Consumer Products & Services *ENM1060*	Refining Hydrocarbons *ENM2060*	Petrochemicals *ENM3060*	
	Refining Rocks & Minerals *ENM2070*	Industrial Materials (Primary Manufacturing) *ENM3070*	
	Supply & Distribution *ENM2080*	Market Basics & Trends *ENM3080*	
Fundamentals of Recycling *ENM1090*	Energy Designs/Systems 1 (Basic Principles) *ENM2090*	Energy Designs/Systems 2 (Practical Applications) *ENM3090*	Management and Conservation
Conservation Challenge *ENM1100*	Environmental Safety *ENM2100*	Integrated Resource Management (Balancing Needs) *ENM3100*	

——— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

MODULE DESCRIPTIONS

Module ENM1010: Overview of Alberta Geology
Students describe the nature and origin of Alberta's energy and mineral resources, explain their significance in society, and identify related career opportunities.

Module ENM1020: Nonrenewable Resources
Students examine general applications of exploration, recovery and production, refining, and reclamation technologies within a nonrenewable energy or mineral industry; and they identify related career opportunities. Potential areas of investigation include conventional crude oil, oil sands, natural gas, coal, nuclear fuels, metallic minerals, nonmetallic minerals and structural materials.

Module ENM1050: Renewable Resources
Students demonstrate applications of one or more renewable energy technologies, examine the contributions of each to sustainable energy development, and identify related career opportunities. Potential areas of investigation include solar, hydro, wind, tidal, biomass and geothermal energy, as well as energy generated from waste.

Module ENM1060: Consumer Products & Services
Students examine the basic techniques involved in developing consumer products and/or services within an energy or mineral industry, and they identify related career opportunities.

Module ENM1090: Fundamentals of Recycling
Students examine opportunities to recycle natural and manufactured materials, and they present the results of research on one or more recycling systems.

Module ENM1100: Conservation Challenge
Students examine relationships between energy and mineral development and the environment, and they propose individual and shared actions that foster environmental stewardship.

Module ENM2010: Managing Alberta's Resources
Students research agencies and structures used to manage the development of Alberta's energy and mineral resources.

Module ENM2020: Conventional Oil/Gas 1 (Resource Exploration)
Students examine specific exploration techniques and technologies within the context of Alberta's conventional oil and/or gas deposits, and they describe related career opportunities.

Module ENM2030: Oil Sands/Heavy Oil/ Coal 1 (Resource Exploration)
Students examine specific exploration techniques and technologies within the context of Alberta's oil sands, heavy oil or coal deposits, and they describe related career opportunities.

Module ENM2040: Metals/Nonmetals 1 (Resource Exploration)
Students examine specific exploration techniques and technologies within the context of a metallic and/or nonmetallic mineral deposit, and they describe related career opportunities.

Module ENM2050: Renewable Energy Technology
Students define and explain the need for sustainable energy development, research one or more renewable energy technologies; e.g., hydro, wind, solar, tidal, biomass, geothermal, nuclear, hydrogen, ethanol, blended fuel, fuel cell, and construct a model of a renewable energy system.

Module ENM2060: Refining Hydrocarbons
Students examine the principles and technologies involved in processing natural gas, refining crude oil, upgrading heavy oils and bitumen, or processing coal. Students also describe related career opportunities.

Module ENM2070: Refining Rocks & Minerals
Students examine the principles and processes involved in refining an industrial (nonmetallic) mineral or a metallic mineral, and they describe related career opportunities.

Module ENM2080: Supply & Distribution
Students research marketing and distribution networks within an energy or mineral industry; examine regulatory structures and policies that influence supply of a commodity, product or service; and describe related career opportunities.

Module ENM2090: Energy Designs/Systems 1 (Basic Principles)
Students investigate the basic principles of energy conservation and efficiency and relate them to energy designs and systems used in the residential, commercial or transportation sector.

Module ENM2100: Environmental Safety
Students identify environmental hazards that result from activities within an energy or mineral industry, and describe specific environmental monitoring and management practices adopted by the industry.

Module ENM3010: Energy & the Environment
Students assess the social, economic and environmental benefits and costs of resource development, and demonstrate personal and shared actions that foster energy conservation and environmental stewardship.

Module ENM3020: Conventional Oil/Gas 2 (Recovery & Production)
Students examine specific recovery and production techniques within the context of a conventional oil and/or gas industry, and they explain related career opportunities.

Module ENM3030: Oil Sands/Heavy Oil/ Coal 2 (Recovery & Production)
Students examine specific recovery and production techniques within the context of Alberta's oil sands, heavy oil or coal deposits; and they explain related career opportunities.

Module ENM3040: Metals/Nonmetals 2 (Recovery & Production)
Students examine specific recovery and production techniques within the context of a metallic and/or nonmetallic mineral deposit, and they explain related career opportunities.

Module ENM3050: Sustainable Energy (The Power & Potential)
Students examine opportunities for planning renewable energy development and conserving conventional energy for its ideal use.

Module ENM3060: Petrochemicals
Students investigate the conversion of hydrocarbons into consumer products within a petrochemical industry, and they explain related career opportunities.

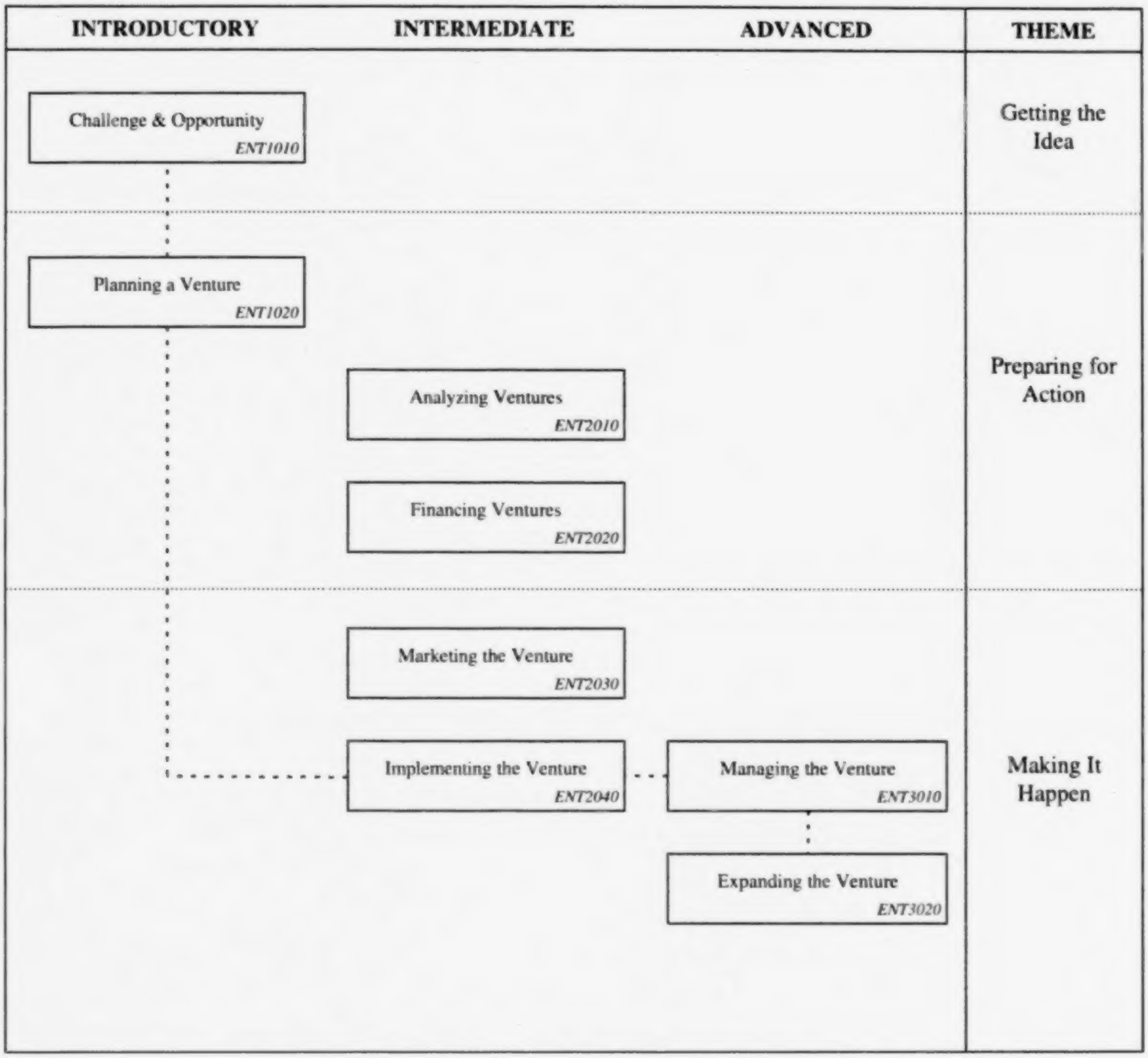
Module ENM3070: Industrial Materials (Primary Manufacturing)
Students investigate technologies used to convert petroleum and mineral resources into industrial (stock) materials used in secondary manufacturing processes, and they explain related career opportunities.

Module ENM3080: Market Basics & Trends
Students explain the basic principles involved in marketing an energy or mineral resource, and analyze trends in the development and marketing of energy or mineral products.

Module ENM3090: Energy Designs/Systems 2 (Practical Applications)
Students analyze energy-saving technologies and systems and design a residential/commercial structure or transportation technology that demonstrates the principles of energy conservation and efficiency.

Module ENM3100: Integrated Resource Management (Balancing Needs)
Students develop and present an integrated plan for sustainable resource development that incorporates supply side and demand side resource management.

SCOPE AND SEQUENCE ENTERPRISE AND INNOVATION



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Challenge & Opportunity *ENT1010*			Getting the Idea
Planning a Venture *ENT1020*	Analyzing Ventures *ENT2010* Financing Ventures *ENT2020*		Preparing for Action
	Marketing the Venture *ENT2030* Implementing the Venture *ENT2040*	Managing the Venture *ENT3010* Expanding the Venture *ENT3020*	Making It Happen

- - - - Recommended sequence

MODULE DESCRIPTIONS

Module ENT1010: Challenge & Opportunity
Students identify, compare and assess a variety of venture opportunities and ideas, and investigate career paths and possibilities where enterprise and innovation are particularly important.

Module ENT1020: Planning a Venture
Students learn and apply the "venture planning process," while planning a venture.

Module ENT2010: Analyzing Ventures
Students gather and analyze data to make informed decisions about the feasibility of ventures.

Module ENT2020: Financing Ventures
Students compare various sources of financing, and choose the method that is best for financing the venture.

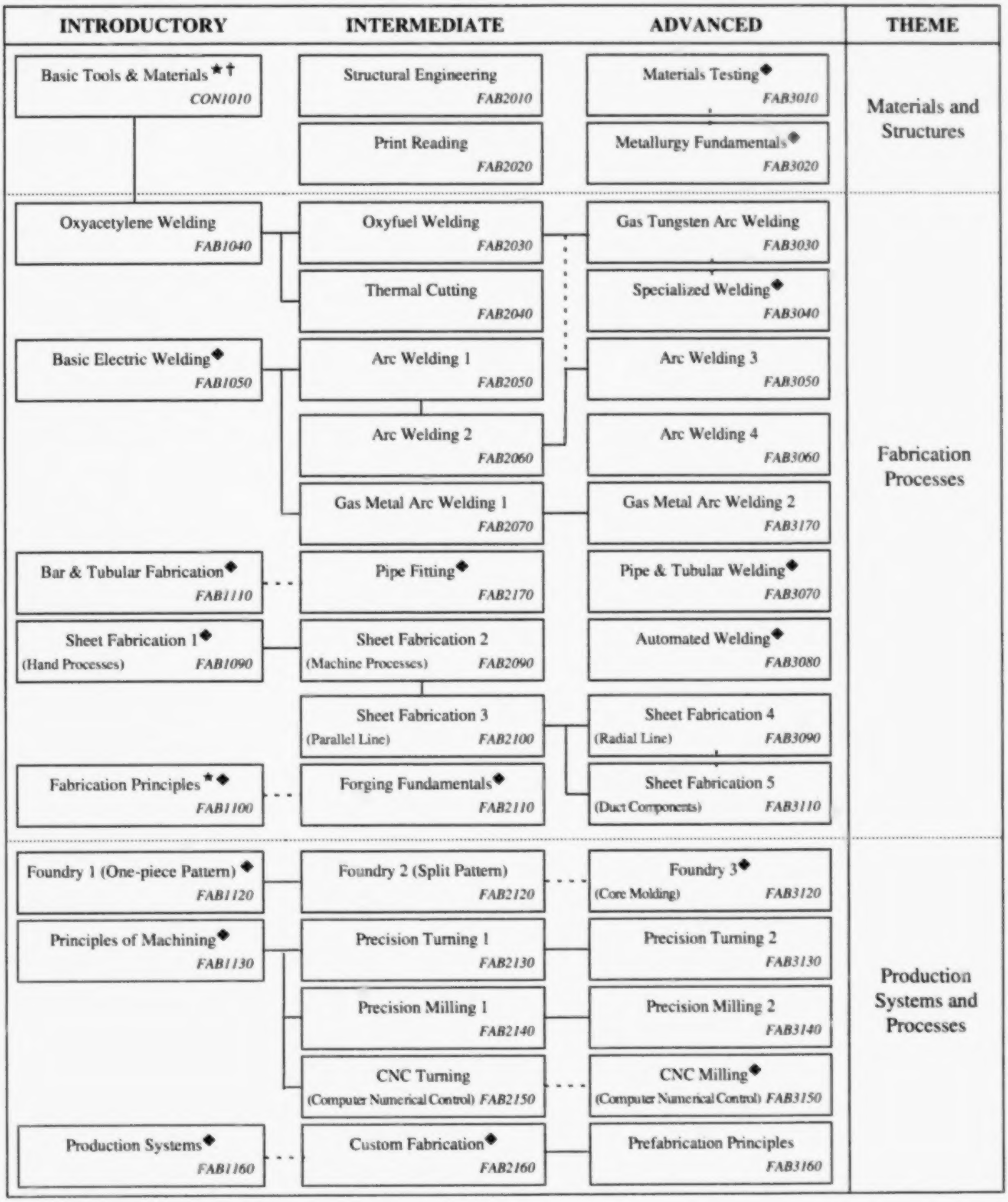
Module ENT2030: Marketing the Venture
Students appraise various marketing strategies, and formulate a marketing strategy for a venture.

Module ENT2040: Implementing the Venture
Students implement and assess a venture.

Module ENT3010: Managing the Venture
Students develop management procedures for a venture.

Module ENT3020: Expanding the Venture
Students explore and assess the elements of success in expanding a venture.

SCOPE AND SEQUENCE FABRICATION STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Basic Tools & Materials ★† CON1010	Structural Engineering FAB2010	Materials Testing◆ FAB3010	Materials and Structures
	Print Reading FAB2020	Metallurgy Fundamentals◆ FAB3020	
Oxyacetylene Welding FAB1040	Oxyfuel Welding FAB2030	Gas Tungsten Arc Welding FAB3030	Fabrication Processes
	Thermal Cutting FAB2040	Specialized Welding◆ FAB3040	
Basic Electric Welding◆ FAB1050	Arc Welding 1 FAB2050	Arc Welding 3 FAB3050	
	Arc Welding 2 FAB2060	Arc Welding 4 FAB3060	
	Gas Metal Arc Welding 1 FAB2070	Gas Metal Arc Welding 2 FAB3170	
Bar & Tubular Fabrication◆ FAB1110	Pipe Fitting◆ FAB2170	Pipe & Tubular Welding◆ FAB3070	
Sheet Fabrication 1◆ (Hand Processes) FAB1090	Sheet Fabrication 2 (Machine Processes) FAB2090	Automated Welding◆ FAB3080	
	Sheet Fabrication 3 (Parallel Line) FAB2100	Sheet Fabrication 4 (Radial Line) FAB3090	
Fabrication Principles★◆ FAB1100	Forging Fundamentals◆ FAB2110	Sheet Fabrication 5 (Duct Components) FAB3110	
Foundry 1 (One-piece Pattern)◆ FAB1120	Foundry 2 (Split Pattern) FAB2120	Foundry 3◆ (Core Molding) FAB3120	Production Systems and Processes
Principles of Machining◆ FAB1130	Precision Turning 1 FAB2130	Precision Turning 2 FAB3130	
	Precision Milling 1 FAB2140	Precision Milling 2 FAB3140	
	CNC Turning (Computer Numerical Control) FAB2150	CNC Milling◆ (Computer Numerical Control) FAB3150	
Production Systems◆ FAB1160	Custom Fabrication◆ FAB2160	Prefabrication Principles FAB3160	

——— Prerequisite . . . . Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
† Module is also offered in Construction Technologies.
◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module CON1010: Basic Tools & Materials
Students develop basic hand tool and production skills to transform safely common building materials into useful products.

Module FAB1040: Oxyacetylene Welding
Students develop basic skills in the safe handling and operation of oxyacetylene equipment.

Module FAB1050: Basic Electric Welding
Students develop basic skills related to safe use and operation of one or more common electric welding processes.

Module FAB1090: Sheet Fabrication 1 (Hand Processes)
Students use basic tools, materials and processes to fabricate sheet materials into finished products, models or prototypes.

Module FAB1100: Fabrication Principles
Students investigate and apply fundamental principles of fabrication to build an artifact or structure from common structural materials.

Module FAB1110: Bar & Tubular Fabrication
Students use cutting, bending and fastening processes to create a variety of products from bar and tubular stock.

Module FAB1120: Foundry 1 (One-Piece Pattern)
Students develop the basic skills required to produce a simple one-piece pattern, a sand mold and a finished casting.

Module FAB1130: Principles of Machining
Students develop basic hand and machine tool knowledge, skills and techniques to mechanically remove materials.

Module FAB1160: Production Systems
Students investigate and compare the principles of production operation and the characteristics of a number of production systems.

Module FAB2010: Structural Engineering
Students investigate the nature of forces and structural materials, and apply their findings to design and fabrication activities.

Module FAB2020: Print Reading
Students develop basic skills in reading and interpreting working drawings to prepare a bill of materials and sequence of operations.

Module FAB2030: Oxyfuel Welding
Students develop basic skills in the safe and efficient use of oxyfuel equipment and supplies to braze and fusion weld.

Module FAB2040: Thermal Cutting
Students develop basic skills to use, safely and efficiently, thermal cutting equipment and supplies.

Module FAB2050: Arc Welding 1
Students develop basic knowledge, skills and attitudes related to the operation and use of shielded metal arc welding (SMAW) equipment and accessories to make a variety of welds in the flat position.

Module FAB2060: Arc Welding 2
Students identify appropriate electrodes, visually assessing a weld, and making the necessary adjustments to improve weld quality while developing horizontal position welding skills.

Module FAB2070: Gas Metal Arc Welding 1
Students build a knowledge and skill base related to gas metal arc welding (GMAW) that has both personal use and commercial applications.

Module FAB2090: Sheet Fabrication 2 (Machine Processes)
Students use basic layout, cutting, bending and fastening operations to transform common types of sheet metals into consumer products.

Module FAB2100: Sheet Fabrication 3 (Parallel Line)
Students expand sheet metal skills related to pattern making, seam constructing and edge treating.

Module FAB2110: Forging Fundamentals
Students determine the effects of heating and striking metal to change its shape and internal structure, using forging techniques.

Module FAB2120: Foundry 2 (Split Pattern)
Students expand their pattern making and foundry skills to produce split pattern molds and finished castings.

Module FAB2130: Precision Turning 1
Students develop basic turning skills to size, shape and finish common machineable metals and plastics.

Module FAB2140: Precision Milling 1
Students develop basic milling skills to shape and finish common machineable metals and plastics.

Module FAB2150: CNC Turning (Computer Numerical Control)
Students develop skills in computer assisted design (CAD) and computer numerical control (CNC) programming to manufacture a product on a CNC lathe.

Module FAB2160: Custom Fabrication
Students work independently, or in a cooperative learning environment, to plan and construct a product/structure that meets a specific client's needs.

Module FAB2170: Pipe Fitting
Students learn about the uses of pipes, basic piping principles and fabrication skills.

Module FAB3010: Materials Testing
Students are introduced to the principles of materials testing, and to the development and evaluation of a mechanical materials test.

Module FAB3020: Metallurgy Fundamentals
Students develop fundamental understandings and skills related to metallurgy, and apply these skills to fabrication processes.

Module FAB3030: Gas Tungsten Arc Welding
Students develop basic knowledge and skills related to the use of gas tungsten arc welding (GTAW) equipment and supplies to weld mild steel in the flat and horizontal positions.

Module FAB3040: Specialized Welding
Students develop specific skills associated with advanced welding techniques to join and repair metals other than low carbon steel.

Module FAB3050: Arc Welding 3
Students learn the role of codes and standards in the welding trade, as well as test welds and develop vertical position welding skills.

Module FAB3060: Arc Welding 4
Students apply and extend positional welding skills, by using a variety of common electrodes and thickness of materials.

Module FAB3070: Pipe & Tubular Welding
Students develop specific skills related to pipe layout, preparation of pipe/tube joints and welding techniques

Module FAB3080: Automated Welding
Students investigate and describe the operation of various manual, semi-automated and automated welding processes and systems used in fabrication industries.

Module FAB3090: Sheet Fabrication 4 (Radial Line)
Students develop specialized skills in cylindrical and conical pattern development and seam construction of ferrous and nonferrous sheet metals.

Module FAB3110: Sheet Fabrication 5 (Duct Components)
Students apply and develop specialized skills in duct component pattern making and fabrication techniques.

Module FAB3120: Foundry 3 (Core Molding)
Students investigate and apply advanced foundry processes to produce a hollow casting, using a sand and core mold.

Module FAB3130: Precision Turning 2
Students develop specialized lathe skills for thread cutting and taper turning techniques.

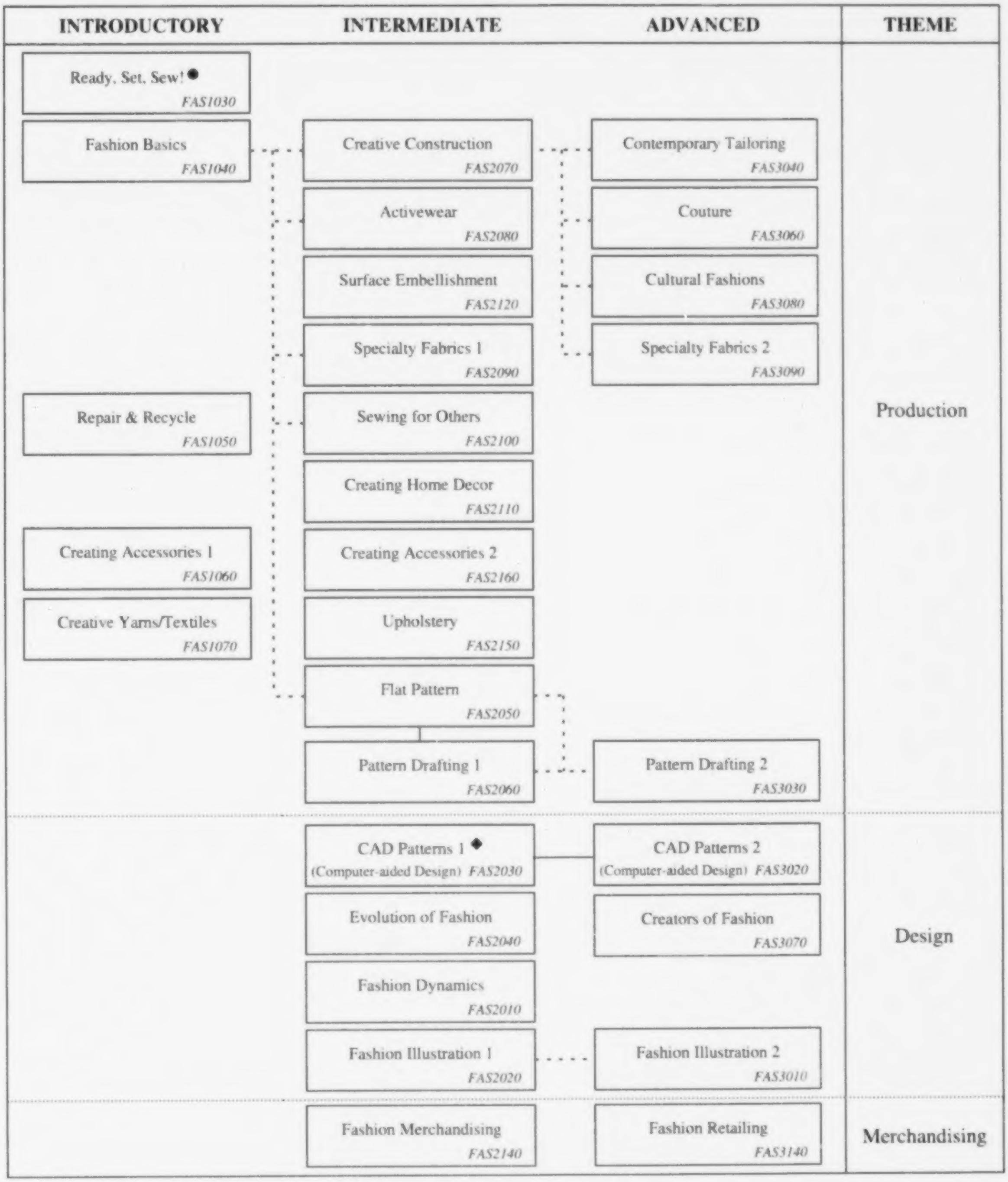
Module FAB3140: Precision Milling 2
Students develop specialized skills to use vertical and/or horizontal milling machines.

Module FAB3150: CNC Milling (Computer Numerical Control)
Students develop skills in computer numerical control (CNC) programming to manufacture a three-dimensional product.

Module FAB3160: Prefabrication Principles
Students work in a cooperative learning environment to plan and construct a prefabricated product/structure to meet the specific needs of a client.

Module FAB3170: Gas Metal Arc Welding 2
Students develop specific skills to assess and improve the quality of gas metal arc welding (GMAW) processes, and gain experience using flux cored arc welding (FCAW) processes.

SCOPE AND SEQUENCE FASHION STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Ready, Set, Sew! ● FAS1030			Production
Fashion Basics FAS1040	Creative Construction FAS2070	Contemporary Tailoring FAS3040	
	Activewear FAS2080	Couture FAS3060	
	Surface Embellishment FAS2120	Cultural Fashions FAS3080	
	Specialty Fabrics 1 FAS2090	Specialty Fabrics 2 FAS3090	
Repair & Recycle FAS1050	Sewing for Others FAS2100		
	Creating Home Decor FAS2110		
Creating Accessories 1 FAS1060	Creating Accessories 2 FAS2160		
Creative Yarns/Textiles FAS1070	Upholstery FAS2150		
	Flat Pattern FAS2050		
	Pattern Drafting 1 FAS2060	Pattern Drafting 2 FAS3030	
	CAD Patterns 1 ◆ (Computer-aided Design) FAS2030	CAD Patterns 2 (Computer-aided Design) FAS3020	Design
	Evolution of Fashion FAS2040	Creators of Fashion FAS3070	
	Fashion Dynamics FAS2010		
	Fashion Illustration 1 FAS2020	Fashion Illustration 2 FAS3010	
	Fashion Merchandising FAS2140	Fashion Retailing FAS3140	Merchandising

——— Prerequisite - - - - Recommended sequence

● Prerequisite to all modules within the Production Theme, with the possible exceptions of FAS1070, FAS2120, FAS2150, FAS2160.

† Module is also offered in Design Studies.

◆ Refer to specific modules for additional prerequisites

MODULE DESCRIPTIONS

Module FAS1030: Ready, Set, Sew!
Students learn how to safely use and care for sewing and pressing equipment, and apply these skills in project assembly.

Module FAS1040: Fashion Basics
Students learn how to determine pattern size, choose a suitable pattern and fabric, make pattern alterations, and prepare the fabric and pattern for layout. Students apply these skills to the assembly of a simple garment.

Module FAS1050: Repair and Recycle
Students learn to restore or recycle garments by repairing, customizing, redesigning or embellishing the garment. Students use these techniques to update a wardrobe or create something new from something old.

Module FAS1060: Creating Accessories 1
Students use basic sewing skills and techniques to construct a home or personal accessory.

Module FAS1070: Creative Yarns/Textiles
Students learn about various yarn or textile arts/crafts, and apply these skills to project construction.

Module FAS2010: Fashion Dynamics
Students learn to recognize and apply the elements and principles of design to wardrobe planning.

Module FAS2020: Fashion Illustration 1
Students discover the world of fashion illustration. They learn to sketch a croquis, incorporating simple gestures, and apply these skills to create fashion illustrations.

Module FAS2030: CAD Patterns 1
Students develop and apply knowledge, skills and techniques necessary to operate a personal computer to design and draft patterns for fashion items.

Module FAS2040: Evolution of Fashion
Students discover the historical influences on fashion, and relate past fashions to present-day styles.

Module FAS2050: Flat Pattern
Students change a basic skirt or pants pattern into a design of choice, using flat pattern designing techniques, and testing the design by sewing in muslin.

Module FAS2060: Pattern Drafting 1
Students use body measurements to draft a basic skirt or pant. They demonstrate drafting techniques needed to create the desired look, and test the draft by sewing in muslin.

Module FAS2070: Creative Construction
Students apply techniques and knowledge of patterns and fabrics to complete a project.

Module FAS2080: Activewear
Students learn how to make unique, attractive and serviceable activewear.

Module FAS2090: Specialty Fabrics 1
Students research, experiment with and produce a project, using a specialty fabric.

Module FAS2100: Sewing for Others
Students sew something for someone else. A client may have special requests that may require special measuring, designing, fitting, sewing techniques and/or resources.

Module FAS2110: Creating Home Decor
Students apply design and sewing techniques to create a home decor fashion.

Module FAS2120: Surface Embellishment
Students use the skills from this module to embellish a wardrobe or home decor.

Module FAS2140: Fashion Merchandising
Students learn policies and techniques used by retail operations to sell fashion.

Module FAS2150: Upholstery
Students innovate and create, or remove and recover, an upholstery item.

Module FAS2160: Creating Accessories 2
Students study accessories related to fashion, and produce a fashion accessory. Possibilities include belts, gloves, neckwear, footwear, jewellery and bags.

Module FAS3010: Fashion Illustration 2
Students create a fashion line, by using technical or impressionistic techniques.

Module FAS3020: CAD Patterns 2
Students, with limited direction, use a personal computer and appropriate software to design and draft patterns for fashion items.

Module FAS3030: Pattern Drafting 2
Students use body measurements to draft a basic bodice and sleeve, demonstrate drafting techniques needed to create the desired look, and test the draft by sewing in muslin.

Module FAS3040: Contemporary Tailoring
Students create a jacket or coat, using contemporary tailoring techniques.

Module FAS3060: Couture
Students study past couturiers to create their own haute couture fashions.

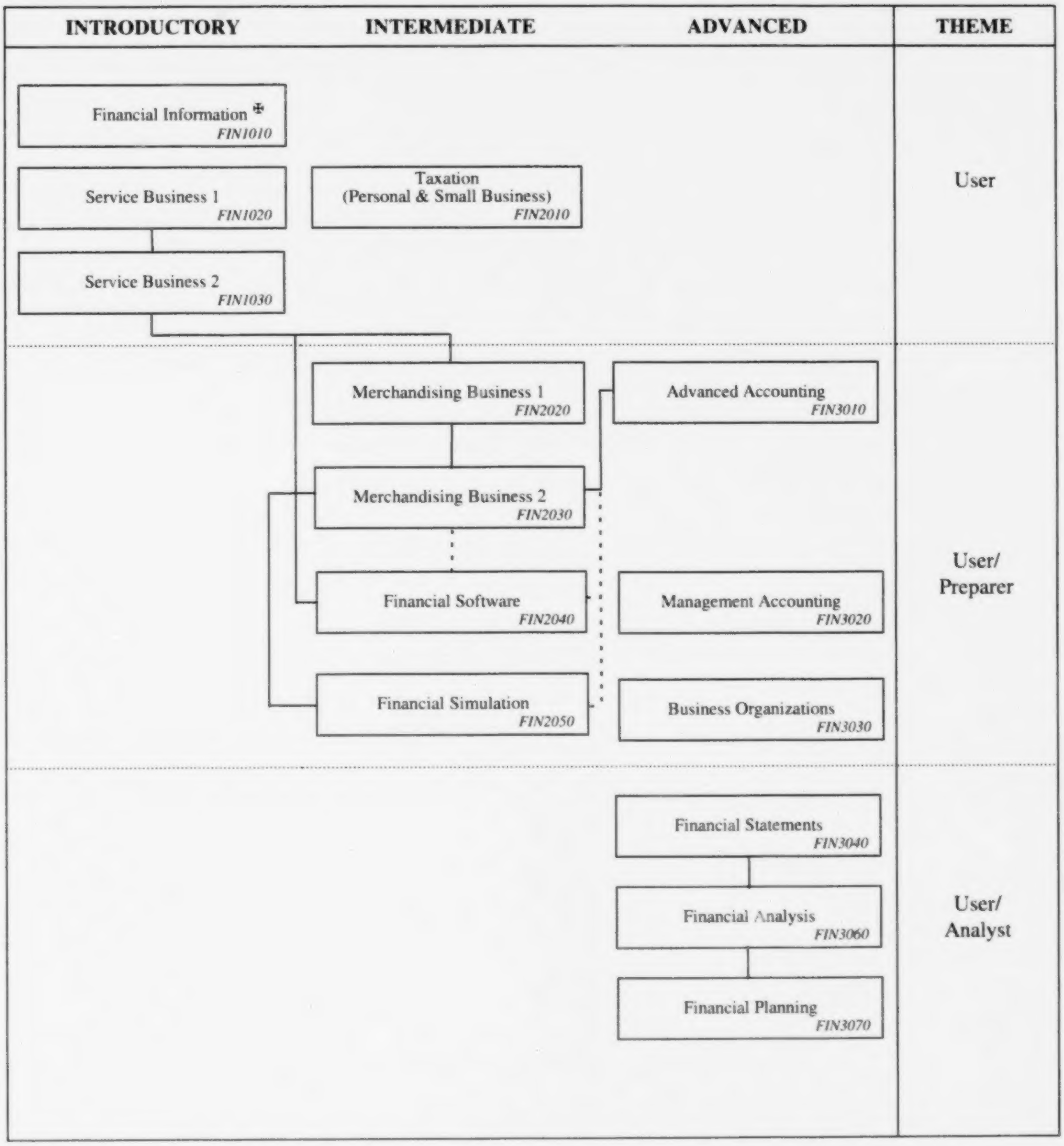
Module FAS3070: Creators of Fashion
Students discover the world of fashion designers.

Module FAS3080: Cultural Fashions
Students research and learn about the fashions of other cultures.

Module FAS3090: Specialty Fabrics 2
Students learn about the characteristics and techniques for preparing, sewing and caring for an advanced specialty fabric. Subsequently, they create and construct a distinctive project.

Module FAS3140: Fashion Retailing
Students analyze fashion retail terms, operations and trends.

SCOPE AND SEQUENCE FINANCIAL MANAGEMENT


INTRODUCTORY
INTERMEDIATE
ADVANCED
THEME
Financial Information ✠
FIN1010
Service Business 1
FIN1020
Taxation
(Personal & Small Business)
FIN2010
User
Service Business 2
FIN1030
Merchandising Business 1
FIN2020
Advanced Accounting
FIN3010
Merchandising Business 2
FIN2030
Financial Software
FIN2040
Management Accounting
FIN3020
User/
Preparer
Financial Simulation
FIN2050
Business Organizations
FIN3030
Financial Statements
FIN3040
Financial Analysis
FIN3060
User/
Analyst
Financial Planning
FIN3070

——— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand.

MODULE DESCRIPTIONS

Module FIN1010: Financial Information
Students explore such concepts as ethics, the economic environment, acquiring and using financial resources, and the effects of government legislation on the finances of an individual and a small business.

Module FIN1020: Service Business 1
Students are introduced to the accounting cycle. They establish a set of books and record business transactions. Students are also introduced to terminology unique to financial accounting.

Module FIN1030: Service Business 2
Students complete the accounting cycle begun in FIN1020 Service Business 1, and prepare financial statements and a budget. Students also develop an awareness of the many career challenges and opportunities to be found in the financial management field.

Module FIN2010: Taxation (Personal & Small Business)
Students examine the Canadian income tax system through the preparation of a variety of personal and small business income tax returns.

Module FIN2020: Merchandising Business 1
Students apply specialized financial accounting procedures associated with the buying and selling of goods in a retail system.

Module FIN2030: Merchandising Business 2
Students complete the accounting cycle established in FIN2020 Merchandising Business 1, prepare financial statements, and establish and operate a payroll system.

Module FIN2040: Financial Software
Students learn how to use an accounting software package that is used in business.

Module FIN2050: Financial Simulation
Students apply accounting principles to realistic business situations, using manual and/or computer simulations based on the records of a proprietorship and/or a partnership.

Module FIN3010: Advanced Accounting
Students apply advanced accounting procedures—including capital assets and uncollectible accounts—used by a variety of businesses. Students also prepare adjustments, using the accrual method of accounting, and examine manufacturing or departmental accounting.

Module FIN3020: Management Accounting
Students explain management accounting, which involves optimizing capital assets for maximum return on investments. Students also examine various internal systems used to safeguard business assets.

Module FIN3030: Business Organizations
Students examine the accounting procedures related to proprietorships, partnerships, corporations and other entities. Students determine the effect the different forms of business ownership have on the equity section of the balance sheet.

Module FIN3040: Financial Statements
Students examine the content and structure of financial statements, and prepare customized financial statements for a variety of businesses.

Module FIN3060: Financial Analysis
Students use formulas and ratios to evaluate the financial status of business organizations, interpret data, report results and recommend change based on the analysis.

Module FIN3070: Financial Planning
Students explain the value of financial planning for a business. They explore the impact of economic trends, changing world markets and tax implications, all of which must be considered when preparing financial forecasts. The concept of market research is also discussed.

SCOPE AND SEQUENCE

FOODS

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Food Basics ✠ *FOD1010*	Food & Nutrition Basics *FOD2010*	Food for the Life Cycle *FOD3010*	Nutrition
	Nutrition & the Athlete *FOD2020*	Nutrition & Digestion *FOD3020*	
	Food Decisions & Health *FOD2030*		
Baking Basics *FOD1020*	Cake & Pastry *FOD2040*	Creative Baking *FOD3030*	Preparation and Presentation
	Yeast Breads & Rolls *FOD2050*	Advanced Yeast Products *FOD3040*	
	Milk Products & Eggs *FOD2060*		
Snacks & Appetizers *FOD1030*	Stocks, Soups & Sauces *FOD2070*	Advanced Soups & Sauces *FOD3050*	
	Vegetables/Fruits/Grains *FOD2080*	Food Presentation *FOD3060*	
	Creative Cold Foods *FOD2090*	Short Order Cooking *FOD3070*	
	Basic Meat Cookery *FOD2100*	Advanced Meat Cookery *FOD3080*	
	Fish & Poultry *FOD2110*	Basic Meat Cutting *FOD3090*	
Meal Planning 1 *FOD1040*	Meal Planning 2 *FOD2120*	Entertaining with Food *FOD3100*	Management
	Vegetarian Cuisine *FOD2130*	Food Processing *FOD3110*	
Fast & Convenience Foods *FOD1050*	Rush Hour Cuisine *FOD2140*	Food Evolution/Innovation *FOD3120*	
	Food Safety & Sanitation *FOD2150*		
	Food Venture *FOD2160*	The Food Entrepreneur *FOD3130*	
Canadian Heritage Foods *FOD1060*	International Cuisine 1 *FOD2170*	International Cuisine 2 *FOD3140*	Social and Cultural

——— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand.

MODULE DESCRIPTIONS

Module FOD1010: Food Basics
Students learn to make wise food choices and to understand recipes, equipment, care in handling food, and the importance of safe and efficient work habits.

Module FOD1020: Baking Basics
Students develop an understanding of basic baking ingredients, by combining them in a variety of ways to make cookies, cakes, muffins and biscuits.

Module FOD1030: Snacks & Appetizers
Students apply the importance of snacking to the way we eat, by making nutritious, as well as delicious, snacks and appetizers.

Module FOD1040: Meal Planning 1
Students begin to develop an understanding of eating and meal requirements through the creative planning, preparing and serving of food.

Module FOD1050: Fast & Convenience Foods
Students consider budget, time, quality of food and food alternatives, by making wise choices in the buying, using and preparing of fast foods and convenience foods.

Module FOD1060: Canadian Heritage Foods
Students become aware of how food in Canada today reflects the country's history and origins, by examining food patterns and customs, and by analyzing and preparing ethnic foods.

Module FOD2010: Food & Nutrition Basics
Students learn which foods are crucial to wellness; how such foods affect current performance and future health; and discover how to choose and prepare nutritious, tasty foods.

Module FOD2020: Nutrition & the Athlete
Students learn to prepare foods that help athletes to meet their training and performance nutritional needs.

Module FOD2030: Food Decisions & Health
Students learn how to balance the energy equation, using strategies for food intake analysis, and by preparing appropriate foods that help the body be the best it can.

Module FOD2040: Cake & Pastry
Students expand their knowledge and skills in the production of a variety of cakes and pastries.

Module FOD2050: Yeast Breads & Rolls
Students describe the role of ingredients and use specialized skills in working with yeast.

Module FOD2060: Milk Products & Eggs
Students develop skills with milk products and eggs, and compare the various products available, what they contribute to cooked foods and how they are best used.

Module FOD2070: Stocks, Soups & Sauces
Students combine stocks with various thickening agents to produce basic stocks, hearty soups and foundation sauces.

Module FOD2080: Vegetables/Fruits/Grains
Students learn about the wide range of vegetable, fruit and grain products available, and how to retain their nutritional value and quality through a variety of cooking methods.

Module FOD2090: Creative Cold Foods
Students learn to combine nutrition and creativity in the preparation of salads and sandwiches.

Module FOD2100: Basic Meat Cookery
Students learn to differentiate between cuts of meat, and apply this to tenderizing and cooking methods.

Module FOD2110: Fish & Poultry
Students learn the nutritional value of fish and poultry and how to select, handle and prepare them.

Module FOD2120: Meal Planning 2
Students learn strategies for planning and creating satisfying meals that accommodate busy schedules or strained budgets.

Module FOD2130: Vegetarian Cuisine
Students learn how to create healthy, wholesome vegetarian diets, by preparing suitable foods in a variety of ways.

Module FOD2140: Rush Hour Cuisine
Students learn unique and quick ways to create nutritious and delicious dishes, using simple ingredients and prepared and convenience foods.

Module FOD2150: Food Safety & Sanitation
Students learn about food-borne illnesses and the importance of food safety and sanitation training for anyone handling food in personal, as well as commercial, applications.

Module FOD2160: Food Venture
Students develop entrepreneurial skills through the planning and creation of a food venture.

Module FOD2170: International Cuisine 1
Students discover other cultures by exploring their cuisine. They learn a variety of international cooking techniques, and use specialized tools to prepare food for a typical day or for a cultural event.

Module FOD3010: Food for the Life Cycle
Students describe how life cycle needs change, and demonstrate how to meet the challenges of each stage, through preparation techniques and the adapting of foods to satisfy all ages.

Module FOD3020: Nutrition & Digestion
Students learn about nutrition and how the body processes food, by appraising current nutritional theories/issues and dietary needs.

Module FOD3030: Creative Baking
Students learn about specialty cakes and pastry products, by selecting and creating various specialty cakes, pastries, desserts and a major baked project, such as a gingerbread house or a wedding cake.

Module FOD3040: Advanced Yeast Products
Students further their skills in the handling of yeast doughs through the preparation of braided breads, fancy dinner rolls, doughnuts, croissants and danishes. Consistency in product quality is emphasized.

Module FOD3050: Advanced Soups & Sauces
Students learn the techniques and ingredients of classic cuisine through the preparation of traditional soups and sauces, and by adapting them for the trend toward lighter eating and nouveau cuisine.

Module FOD3060: Food Presentation
Students develop creativity and flair while learning the techniques of tempting and artistic food presentation.

Module FOD3070: Short Order Cooking
Students develop foundation skills in the preparation and principles underlying short order cookery.

Module FOD3080: Advanced Meat Cookery
Students develop further awareness of the different types of meats available, and of meat cookery, through the preparation of a variety of meat dishes.

Module FOD3090: Basic Meat Cutting
Students gain skills in meat cutting that may be a stepping-stone to a career in the retail or wholesale meat cutting industry.

Module FOD3100 Entertaining with Food
Students plan and prepare food for an event, and develop organizational skills that may be used in the hospitality industry, at home or in entrepreneurial endeavours.

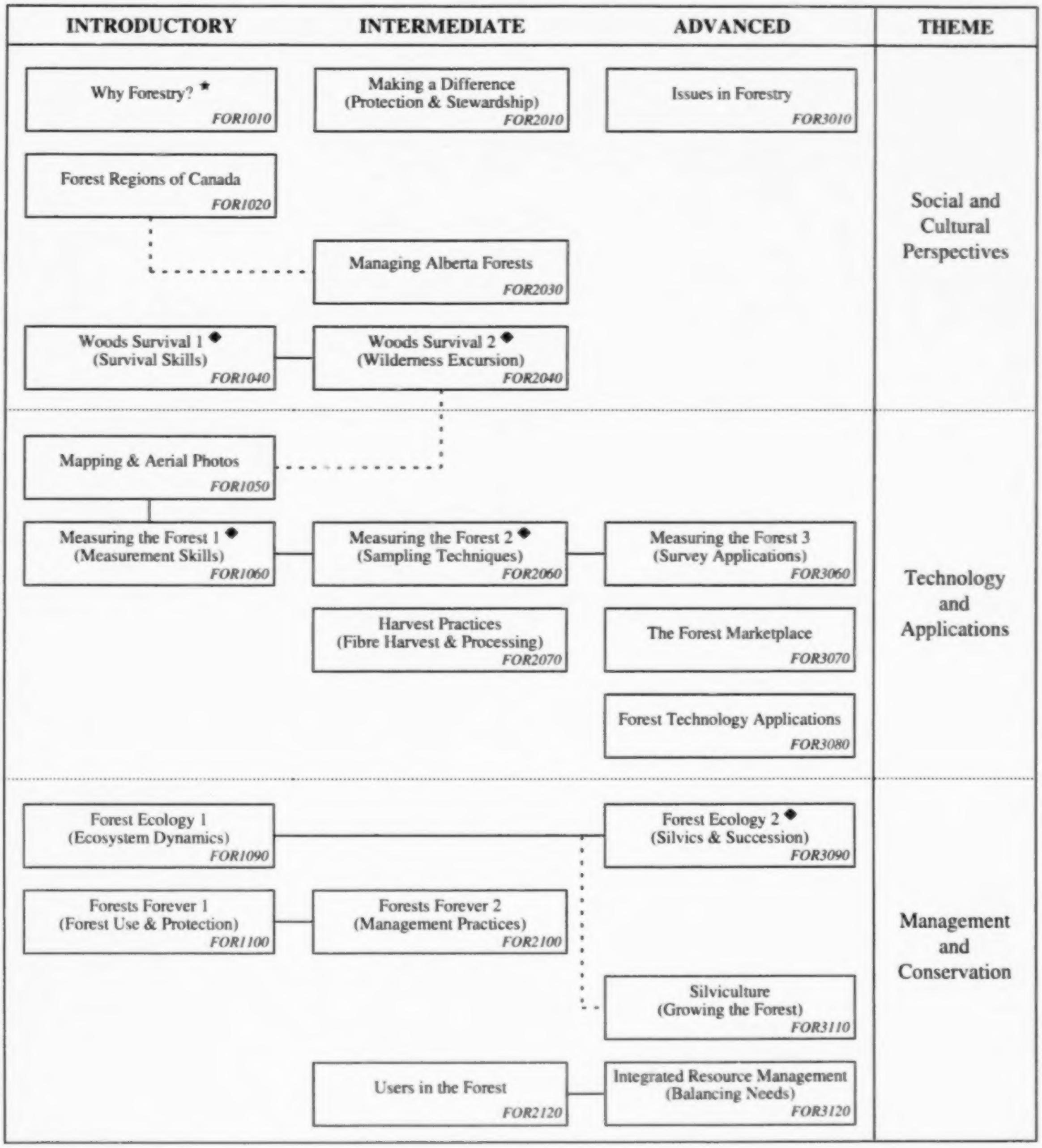
Module FOD3110: Food Processing
Students explore how technology affects our food supply, by using a variety of methods to process fresh foods.

Module FOD3120: Food Evolution/Innovation
Students explore how food has changed and what foods may be eaten in the future, prepare a wide variety of foods, and learn how they evolved.

Module FOD3130: The Food Entrepreneur
Students plan, test and market a food product or products.

Module FOD3140: International Cuisine 2
Students explore, in depth, the cuisine of another country in order to appreciate the richness of its history and culture. They discover its foods, experience traditional cooking methods, and learn about food customs.

SCOPE AND SEQUENCE FORESTRY



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Why Forestry? ★ FOR1010	Making a Difference (Protection & Stewardship) FOR2010	Issues in Forestry FOR3010	Social and Cultural Perspectives
Forest Regions of Canada FOR1020			
	Managing Alberta Forests FOR2030		
Woods Survival 1 ◆ (Survival Skills) FOR1040	Woods Survival 2 ◆ (Wilderness Excursion) FOR2040		
Mapping & Aerial Photos FOR1050			Technology and Applications
Measuring the Forest 1 ◆ (Measurement Skills) FOR1060	Measuring the Forest 2 ◆ (Sampling Techniques) FOR2060	Measuring the Forest 3 (Survey Applications) FOR3060	
	Harvest Practices (Fibre Harvest & Processing) FOR2070	The Forest Marketplace FOR3070	
		Forest Technology Applications FOR3080	
Forest Ecology 1 (Ecosystem Dynamics) FOR1090		Forest Ecology 2 ◆ (Silvics & Succession) FOR3090	Management and Conservation
Forests Forever 1 (Forest Use & Protection) FOR1100	Forests Forever 2 (Management Practices) FOR2100		
		Silviculture (Growing the Forest) FOR3110	
	Users in the Forest FOR2120	Integrated Resource Management (Balancing Needs) FOR3120	

—— Prerequisite ---- Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module FOR1010: Why Forestry?
Students explain the social, economic and environmental significance of forests, describe the impact of individuals on forests, and identify career opportunities in forestry.

Module FOR1020: Forest Regions of Canada
Students identify factors that determine the distribution of forests, as well as research forest regions of Canada with an emphasis on specific species and forest associations found in Alberta.

Module FOR1040: Woods Survival 1 (Survival Skills)
Students demonstrate basic skills required for responsible participation in a range of outdoor forest activities.

Module FOR1050: Mapping & Aerial Photos
Students interpret information from different types of maps and aerial photographs used in the forestry industry.

Module FOR1060: Measuring the Forest 1 (Measurement Skills)
Students demonstrate basic forest measurement skills, and apply these skills to sample fibre values in a forested region.

Module FOR1090: Forest Ecology 1 (Ecosystem Dynamics)
Students investigate forest ecosystems, and explain the structure and functioning of trees.

Module FOR1100: Forests Forever 1 (Forest Use & Protection)
Students describe past and present uses of Canada's forests, and explain how research and technology assist in forest management.

Module FOR2010: Making a Difference (Protection & Stewardship)
Students analyze the impact of attitudes, actions and lifestyles on forests, and propose individual and shared actions that foster environmental stewardship.

Module FOR2030: Managing Alberta Forests
Students research agencies and structures used to manage forested lands in Alberta.

Module FOR2040: Woods Survival 2 (Wilderness Excursion)
Students plan, prepare for and conduct an extended outdoor wilderness trip in the forest.

Module FOR2060: Measuring the Forest 2 (Sampling Techniques)
Students research current forest inventory practices, and demonstrate appropriate strategies for sampling the fibre and nonfibre value of forests.

Module FOR2070: Harvest Practices (Fibre Harvest & Processing)
Students research the steps involved in harvesting and processing the forest fibre resource.

Module FOR2100: Forests Forever 2 (Management Practices)
Students explain Alberta's forest management goals, and describe the current management practices used to address these goals.

Module FOR2120: Users in the Forest
Students identify different forest users, and explain the planning principles used to develop an integrated resource management plan.

Module FOR3010: Issues in Forestry
Students analyze current local and global issues in forest management, and demonstrate individual and shared actions that foster environmental stewardship.

Module FOR3060: Measuring the Forest 3 (Survey Applications)
Students explain management applications of data collected from a forest survey, and examine the role of technology in current forest inventory practices.

Module FOR3070: The Forest Marketplace
Students describe the range of consumer products and services derived from Canada's forests, and research the production and marketing of these forest products.

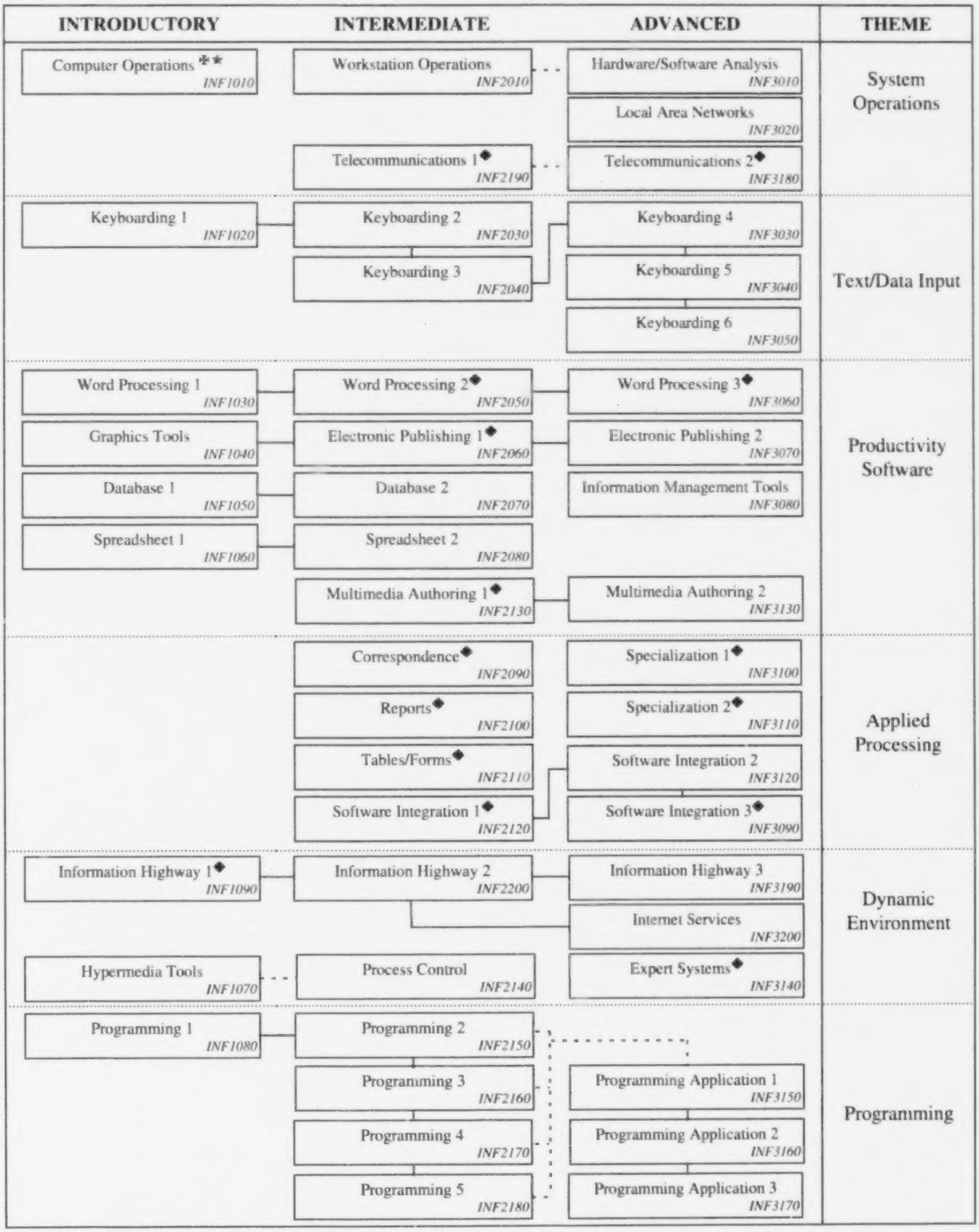
Module FOR3080: Forest Technology Applications
Students examine research and technological applications in the forest industry, and examine changing career opportunities in the forestry sector.

Module FOR3090: Forest Ecology 2 (Silvics & Succession)
Students investigate the interrelationships among soil, water, air, trees and the environment, and explain how forests change over time as a result of these interrelationships.

Module FOR3110: Silviculture (Growing the Forest)
Students demonstrate knowledge of the techniques used to establish, grow and harvest tree crops.

Module FOR3120: Integrated Resource Management (Balancing Needs)
Students develop and present an integrated plan for sustainable development of the forest resource.

SCOPE AND SEQUENCE INFORMATION PROCESSING



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Computer Operations ✠★ *INF1010*	Workstation Operations *INF2010*	Hardware/Software Analysis *INF3010*	System Operations
		Local Area Networks *INF3020*	
	Telecommunications 1◆ *INF2190*	Telecommunications 2◆ *INF3180*	
Keyboarding 1 *INF1020*	Keyboarding 2 *INF2030*	Keyboarding 4 *INF3030*	Text/Data Input
	Keyboarding 3 *INF2040*	Keyboarding 5 *INF3040*	
		Keyboarding 6 *INF3050*	
Word Processing 1 *INF1030*	Word Processing 2◆ *INF2050*	Word Processing 3◆ *INF3060*	Productivity Software
Graphics Tools *INF1040*	Electronic Publishing 1◆ *INF2060*	Electronic Publishing 2 *INF3070*	
Database 1 *INF1050*	Database 2 *INF2070*	Information Management Tools *INF3080*	
Spreadsheet 1 *INF1060*	Spreadsheet 2 *INF2080*		
	Multimedia Authoring 1◆ *INF2130*	Multimedia Authoring 2 *INF3130*	
	Correspondence◆ *INF2090*	Specialization 1◆ *INF3100*	Applied Processing
	Reports◆ *INF2100*	Specialization 2◆ *INF3110*	
	Tables/Forms◆ *INF2110*	Software Integration 2 *INF3120*	
	Software Integration 1◆ *INF2120*	Software Integration 3◆ *INF3090*	
Information Highway 1◆ *INF1090*	Information Highway 2 *INF2200*	Information Highway 3 *INF3190*	Dynamic Environment
		Internet Services *INF3200*	
Hypermedia Tools *INF1070*	Process Control *INF2140*	Expert Systems◆ *INF3140*	
Programming 1 *INF1080*	Programming 2 *INF2150*		Programming
	Programming 3 *INF2160*	Programming Application 1 *INF3150*	
	Programming 4 *INF2170*	Programming Application 2 *INF3160*	
	Programming 5 *INF2180*	Programming Application 3 *INF3170*	

——— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand. ★ Module provides a strong foundation for further learning in this strand.

◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module INF1010: Computer Operations
Students develop personal use skills basic to all modules in the Information Processing strand in the following applications: file management, basic hardware and software operations, text entry and workstation routines.

Module INF1020: Keyboarding 1
Students develop accurate touch keystroking of text and data appropriate to personal use and the application of efficient workstation procedures.

Module INF1030: Word Processing 1
Students develop skill in using basic commands and functions in word processing software, including document editing, and the formatting and printing of reports, correspondence and tables suitable for personal use applications.

Module INF1040: Graphics Tools
Students learn the basic commands and functions of computer graphics software, including bitmapped graphics (paint program) and vector graphics (draw program). Students also develop basic skills in manipulating existing graphics, as well as in producing their own graphics.

Module INF1050: Database 1
Students are introduced to the basic commands and functions of database software, and demonstrate how this software can be used as a personal tool in data and information management.

Module INF1060: Spreadsheet 1
Students have an opportunity to use basic functions and commands in spreadsheet software for general data manipulation and personal record keeping.

Module INF1070: Hypermedia Tools
Students develop basic skills with tools used for computerized presentations involving text, data, graphics, sound and animation.

Module INF1080: Programming 1
Students are introduced to computer programming languages and a structured programming environment, and they construct algorithms and code instructions to solve identified problems.

Module INF1090: Information Highway 1
Students develop personal use Internet skills for accessing and communicating data and information, with particular emphasis on the world wide web and e-mail.

Module INF2010: Workstation Operations
Students learn computer workstation operations, including computer architecture, peripherals, configurations, operating system environments and platforms, utility software, diagnostic and protection software, hard drive file updating and maintenance, support resource application and troubleshooting activities.

Module INF2030: Keyboarding 2
Students enhance their personal use keyboarding competencies by increasing the rate of accurate touch keystroking of the alphabetic, numeric and selected punctuation keys.

Module INF2040: Keyboarding 3
Students enhance their keyboarding competencies, by increasing the rate of accurate touch keystroking of alphabetic, numeric and all punctuation keys to support personal use and limited, entry-level, workplace opportunities.

Module INF2050: Word Processing 2
Students expand their skills in using word processing software commands and functions to produce mailable reports and correspondence, including letters, memorandums and tables, all from rough draft copy.

Module INF2060: Electronic Publishing 1
Students develop skill, using electronic/desktop publishing software to create a variety of camera-ready documents.

Module INF2070: Database 2
Students use all the commands and functions of electronic database software that support effective and efficient database applications.

Module INF2080: Spreadsheet 2
Students demonstrate advanced level spreadsheet commands and functions to calculate and manipulate data and to prepare appropriate reports and printouts in text and graphic format.

Module INF2090: Correspondence
Students expand their rate of document production as they prepare various forms of correspondence in mailable form, using word processing software.

Module INF2100: Reports
Students expand their rate of production as they prepare various reports and manuscripts in mailable form.

Module INF2110: Tables/Forms
Students expand their rate of document production as they prepare various tables/forms in mailable form.

Module INF2120: Software Integration 1
Students develop document production skills requiring the integration of data, text and graphics.

Module INF2130: Multimedia Authoring 1
Students are introduced to multimedia software and provided with an opportunity to develop basic authoring competence, by accessing and integrating software resident text, video and audio clips.

Module INF2140: Process Control
Students develop skills in robotics/simulation software control by creating, modifying and using programs that incorporate computer-controlled movements and events in robotics/simulation activities and applications.

Module INF2150: Programming 2
Students increase their programming skills, by designing and generating programming code to handle decision making and repetitive processes.

Module INF2160: Programming 3
Students increase their programming skills, by using subprogram structures.

Module INF2170: Programming 4
Students increase their programming skills, by developing and using derived data types.

Module INF2180: Programming 5
Students increase their programming skills, by developing and using recursive, sorting and merging algorithms.

Module INF2190 Telecommunications 1
Students learn how to select and use various wired and wireless telecommunication systems. By using the Internet, they investigate how communication principles, bandwidth, telecommunication infrastructure and wave spectrum affects telecommunication systems.

Module INF2200: Information Highway 2
Students learn how to produce a web page for the Internet.

Module INF3010: Hardware/Software Analysis
Students analyze, compare and evaluate hardware/software based on user requirements.

Module INF3020: Local Area Networks
Students learn about local area network (LAN) computer systems, including hardware and peripheral configurations, interface protocols and data transmission characteristics.

Module INF3030: Keyboarding 4
Students develop their text and data keyboarding skills to entry-level occupational expectations.

Module INF3040: Keyboarding 5
Students increase their occupational-level keyboarding competence of text, data and function/service keys, using straight copy and edited material.

Module INF3050: Keyboarding 6
Students enhance their occupational-level keyboarding competence of all keystroke functions, using unedited, edited and straight copy material.

Module INF3060: Word Processing 3
Students develop occupational-level competence in the use of word processing software commands and functions to produce mailable reports, correspondence and tables, including the importing and merging of text, data and graphics.

Module INF3070: Electronic Publishing 2
Students use the functions and commands of electronic/desktop publishing software as they integrate text composing, editing, typesetting, graphics generation and page layout functions to create customized, professional, quality documents.

Module INF3080: Information Management Tools
Students develop competence in using information management systems software, such as project management, schedules and planners for either personal or workplace applications.

Module INF3090: Software Integration 3
Students develop high production rates as they process documents from unedited and unformatted copy, using numerous functions/commands to create, revise, format and print a wide range of mailable copy.

Module INF3100: Specialization 1
Students specialize in document preparation, terminology application and associated office routine expectations in a specific focus area, such as a medical, legal, petroleum, real estate, insurance, travel/tourism, forestry or agricultural environment.

Module INF3110: Specialization 2
Students develop workplace competence in a specific focus area, such as medical, legal, petroleum, real estate, insurance, travel/tourism, forestry or agricultural environment, by creating and completing appropriate documents that employ specialized communication skills and conform to workplace expectations and time constraints.

Module INF3120: Software Integration 2
Students expand their document production skills to workplace standards. Documents could require the importing and integration of word processing, spreadsheet, graphics and database files.

Module INF3130: Multimedia Authoring 2
Students learn to use a multimedia file or multimedia authoring software based on digitized input of text, video and audio clips.

Module INF3140: Expert Systems
Students acquire knowledge of expert systems, such as artificial intelligence and virtual reality. They gain competence, by developing or modifying programs that incorporate computer-controlled environments and multimedia interactive activities and applications.

Module INF3150: Programming Application 1
Students create programs that use external files.

Module INF3160: Programming Application 2
Students create a program, using a second programming language.

Module INF3170: Programming Application 3
Students enhance a program, using a second programming language.

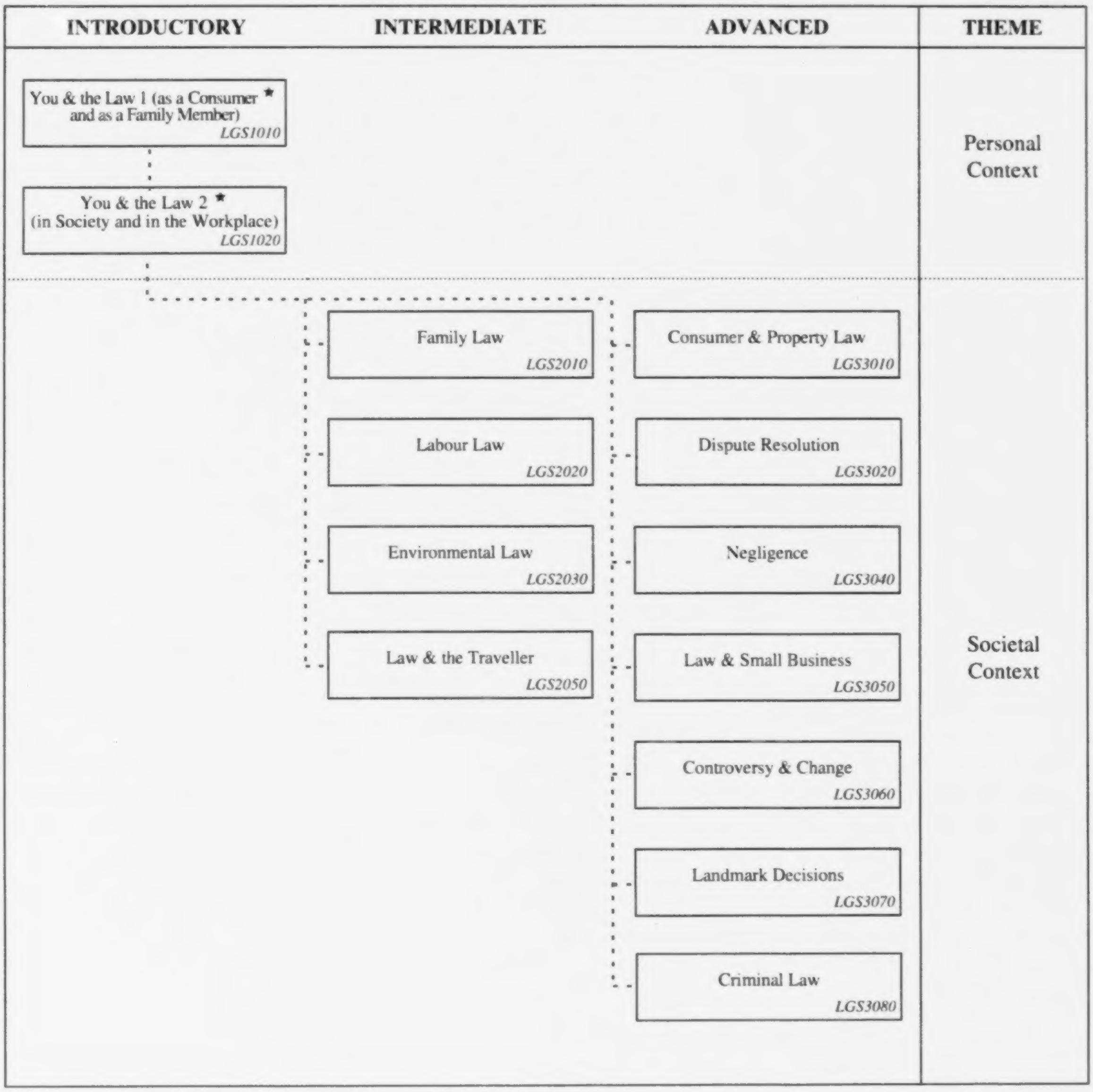
Module INF3180 Telecommunications 2
Students demonstrate knowledge of telecommunications systems by designing a new system. They use the Internet in researching and developing their design and for comparing and contrasting various telecommunications initiatives. Students analyze the effect this is having on the individual and society.

Module INF3190 Information Highway 3
Students develop and maintain an Internet/intranet web site that makes use of advanced features.

Module INF3200 Internet Services
Students expand their skills from Information Highway 2 by learning how to operate, maintain and build an Internet/intranet site that may include computer bulletin boards, forums, electronic mail, Internet list servers, and/or moderated newsgroups. Proper use of hardware, software and liaison with users and clients is emphasized.

SCOPE AND SEQUENCE

LEGAL STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
You & the Law 1 (as a Consumer and as a Family Member) * *LGS1010* You & the Law 2 * (in Society and in the Workplace) *LGS1020*			Personal Context
	Family Law *LGS2010* Labour Law *LGS2020* Environmental Law *LGS2030* Law & the Traveller *LGS2050*	Consumer & Property Law *LGS3010* Dispute Resolution *LGS3020* Negligence *LGS3040* Law & Small Business *LGS3050* Controversy & Change *LGS3060* Landmark Decisions *LGS3070* Criminal Law *LGS3080*	Societal Context

——— Prerequisite - - - - Recommended sequence

* Module provides a strong foundation for further learning in this strand.

MODULE DESCRIPTIONS

Module LGS1010: You & the Law 1 (as a Consumer and as a Family Member)
Students learn about laws affecting consumers and family members through the use of realistic scenarios and case studies.

Module LGS1020: You & the Law 2 (in Society and in the Workplace)
Students identify laws that affect people in the workplace, and examine elements of criminal and civil laws that the average citizen should know about.

Module LGS2010: Family Law
Students examine a broad range of legal issues relating to personal relationships.

Module LGS2020: Labour Law
Students learn about unions and collective bargaining, contracts of employment, employment insurance, workers' compensation and women in the workplace. Challenging issues and law-related careers are also considered.

Module LGS2030: Environmental Law
Students identify laws related to the environment and describe how new environmental information affects the law. Students also examine, through case studies, the role of groups and individuals in bringing about changes in environmental law.

Module LGS2050: Law & the Traveller
Students identify and describe the issues and legal considerations that may arise when individuals travel domestically and internationally.

Module LGS3010: Consumer & Property Law
Students identify laws relating to renting personal and real property, purchasing a home, making investments and building or renovating a home. Students describe methods for protecting the consumer, challenging issues and law-related careers.

Module LGS3020: Dispute Resolution
Students demonstrate and apply such methods as negotiation, mediation, arbitration and adjudication used to resolve disputes. Students also identify career opportunities and challenging issues related to the dispute resolution methods.

Module LGS3040: Negligence
Students use case studies and scenarios to explore the legal meaning of negligence and legal action relating to negligence.

Module LGS3050: Law & Small Business
Students learn about laws relating to starting a business, running a business and ending a business. Students also explore challenging issues that affect small business and law-related careers.

Module LGS3060: Controversy & Change
Students explore how controversial issues evoke responses that may bring about changes in the law, and describe a wide variety of strategies that may be used for changing the law.

Module LGS3070: Landmark Decisions
Students analyze, in detail, "landmark decisions" and their subsequent influence on the political, social and economic environment.

Module LGS3080: Criminal Law
Students examine the criminal justice system, including the criminal process and the roles and responsibilities of the participants. Students also explore challenging issues and law-related careers.

SCOPE AND SEQUENCE LOGISTICS

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Logistics ✠ *LOG1010*			Introduction to Logistics
Warehouse & Distribute 1 *LOG1020*	Warehouse & Distribute 2 *LOG2010*	Warehouse & Distribute 3 *LOG3010*	Warehousing and Distribution
Traffic & Transport 1 *LOG1030*	Traffic & Transport 2 *LOG2020*	Traffic & Transport 3 *LOG3020*	Traffic and Transportation
Purchasing 1 *LOG1040*	Purchasing 2 *LOG2030*	Purchasing 3 *LOG3030*	Purchasing
	Inventory Management 1 *LOG2040*	Inventory Management 2 *LOG3040*	Inventory Management and Control

——— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand.

MODULE DESCRIPTIONS

Module LOG1010: Logistics
Students identify logistics as a sector in Canada's economy, by describing related subsectors, users and providers of logistics services. Students also identify current and emerging career paths in logistics.

Module LOG1020: Warehouse & Distribute 1
Students explore warehousing and distribution systems as subsectors of logistics and participate in warehousing, materials handling systems, stock placement and documentation activities.

Module LOG1030: Traffic and Transport 1
Students distinguish among modes, vehicles and vessels involved in transportation, identify the advantages and disadvantages of single mode and intermodal usages, and demonstrate basic skills relating to map reading, technology, handling equipment and handling dangerous goods.

Module LOG1040: Purchasing 1
Students identify the role of purchasing, distinguish between public and private purchasing activities, perform expediting activities, and provide service to internal and external customers.

Module LOG2010: Warehouse & Distribute 2
Students examine types of warehousing and develop basic skills in packaging, packing, documentation and materials handling. Students also explore bonding principles and practices and career opportunities within the warehousing and distribution sector.

Module LOG2020: Traffic & Transport 2
Students develop basic skills in tracking, route planning, scheduling, load planning and other competencies related to handling outgoing shipments, including documentation, customs (import and export), weather and climate conditions, and strategies for preventive maintenance in traffic and transportation.

Module LOG2030: Purchasing 2
Students develop an understanding of the principles of locus of control, economies of scale, risk management, surface and hidden costs, tendering and procurement. Students also perform purchasing activities and address related factors, including budgets and inflation, within an organization's decision-making structure.

Module LOG2040: Inventory Management 1
Students identify the role of inventory management and control, and participate in and demonstrate basic abilities to manage and control inventory.

Module LOG3010: Warehouse & Distribute 3
Students develop an understanding and competencies relating to stock movement and placement procedures, product tracking and the use of automated warehouse systems. Students also develop competencies in labelling, containerizing and palletizing items.

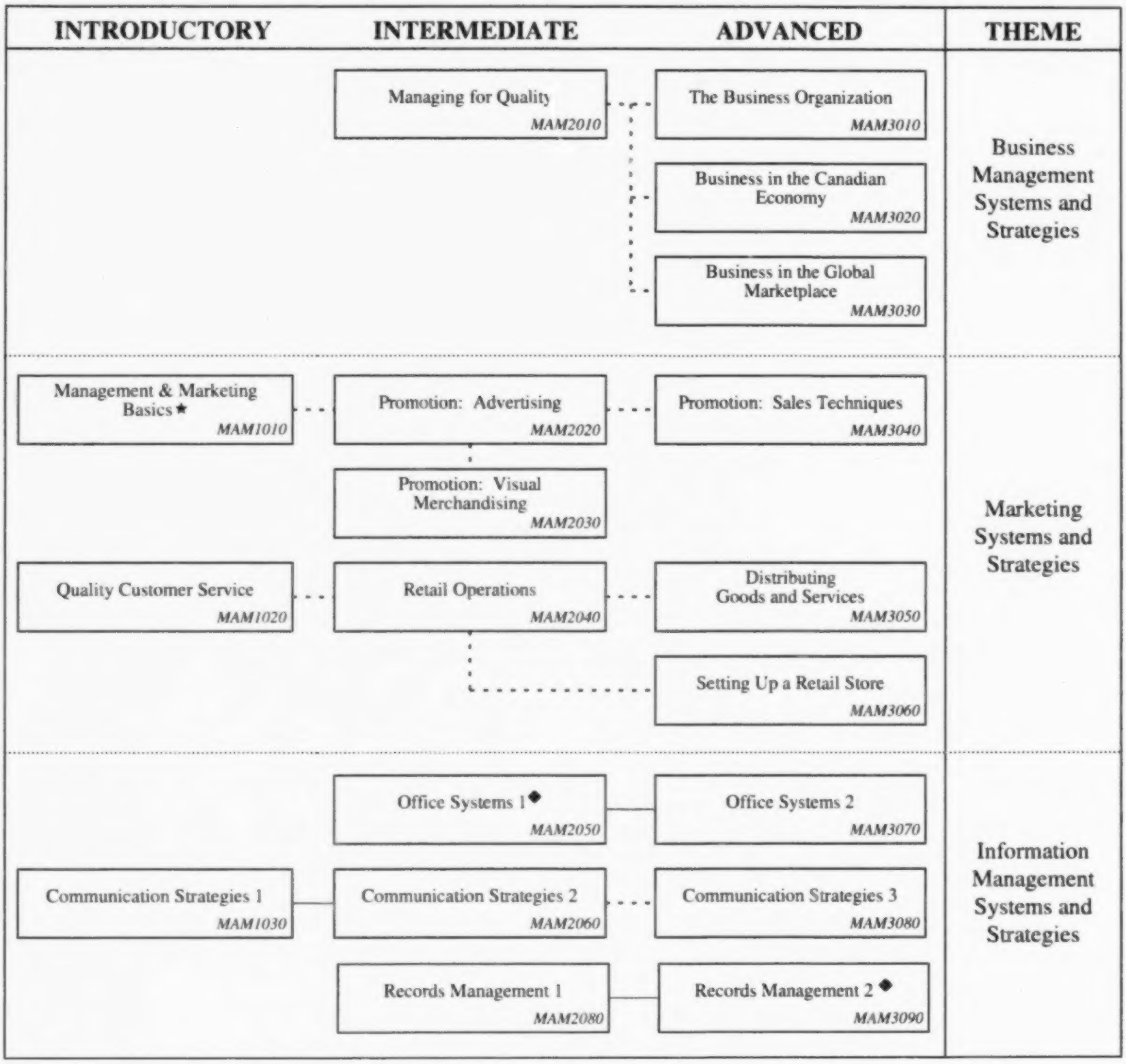
Module LOG3020: Traffic & Transport 3
Students explore transport regulations and licencing, and develop competency in planning a route and developing contingency plans.

Module LOG3030: Purchasing 3
Students develop knowledge about contract and business law, supplier quality assurance and performance management. Students also develop negotiation skills and an appreciation for the importance of professional ethics.

Module LOG3040: Inventory Management 2
Students demonstrate competencies relating to product movement and replenishment strategies, budgeting, internal controls and asset recovery.

SCOPE AND SEQUENCE

MANAGEMENT AND MARKETING



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
	Managing for Quality *MAM2010*	The Business Organization *MAM3010*	Business Management Systems and Strategies
		Business in the Canadian Economy *MAM3020*	
		Business in the Global Marketplace *MAM3030*	
Management & Marketing Basics ★ *MAM1010*	Promotion: Advertising *MAM2020*	Promotion: Sales Techniques *MAM3040*	Marketing Systems and Strategies
	Promotion: Visual Merchandising *MAM2030*		
Quality Customer Service *MAM1020*	Retail Operations *MAM2040*	Distributing Goods and Services *MAM3050*	
		Setting Up a Retail Store *MAM3060*	
	Office Systems 1 ◆ *MAM2050*	Office Systems 2 *MAM3070*	Information Management Systems and Strategies
Communication Strategies 1 *MAM1030*	Communication Strategies 2 *MAM2060*	Communication Strategies 3 *MAM3080*	
	Records Management 1 *MAM2080*	Records Management 2 ◆ *MAM3090*	

—— Prerequisite   . . . . Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module MAM1010: Management & Marketing Basics
Students identify basic management and marketing concepts, and describe retail merchandising strategies of value to the retail employee, manager or owner.

Module MAM1020: Quality Customer Service
Students identify and describe the target customer and the selling floor, including sales and nonsales activities.

Module MAM1030: Communication Strategies 1
Students improve oral and written business communications skills necessary for efficient and effective management of information. The focus is on business writing strategies and composing at the computer when preparing memorandums, e-mail messages and business letters.

Module MAM2010: Managing for Quality
Students demonstrate basic managerial skills, by assuming roles and responsibilities of management to coordinate available resources to achieve quality results.

Module MAM2020: Promotion: Advertising
Students are introduced to communication channels, delivery strategies and advertising media that can be used to inform potential customers about products and services available in the marketplace.

Module MAM2030: Promotion: Visual Merchandising
Students identify different types of visual merchandising, and describe how to construct attention-getting displays and how to evaluate visual merchandising.

Module MAM2040: Retail Operations
Students identify retail operations that are typically performed off the selling floor, away from customers.

Module MAM2050: Office Systems 1
Students identify and describe strategies and procedures in the office environment and managing processes and protocols related to electronic equipment, written communication transmittal and business travelling arrangements.

Module MAM2060: Communication Strategies 2
Students improve their basic oral and written communications strategies necessary to efficient and effective management of information. The focus is on technical writing strategies and composing at the computer when preparing informal business reports and proposals.

Module MAM2080: Records Management 1
Students demonstrate basic records management skills for a manual records system, emphasizing alphabetic coding procedures.

Module MAM3010: The Business Organization
Students identify and describe organizational structures, management theories and organizations as working units. Students also explain their beliefs of what successful organizations might look like in the future.

Module MAM3020: Business in the Canadian Economy
Students expand and relate their knowledge of economics to how business decisions are made within the community, the province, nationally and internationally.

Module MAM3030: Business in the Global Marketplace
Students identify the opportunities and challenges that confront business people in establishing a global business operation.

Module MAM3040: Promotion: Sales Techniques
Students learn techniques for successful selling.

Module MAM3050: Distributing Goods and Services
Students explore the channels of distribution and modes of transportation used to direct goods from the producer to the consumer.

Module MAM3060: Setting Up a Retail Store
Students develop retail store images, examine potential locations and design store layouts. Students should be given hands-on experience by researching a location for an actual retailing opportunity and design a layout for this retail store. This module focuses on students owning a retail business and learning the necessary steps for success.

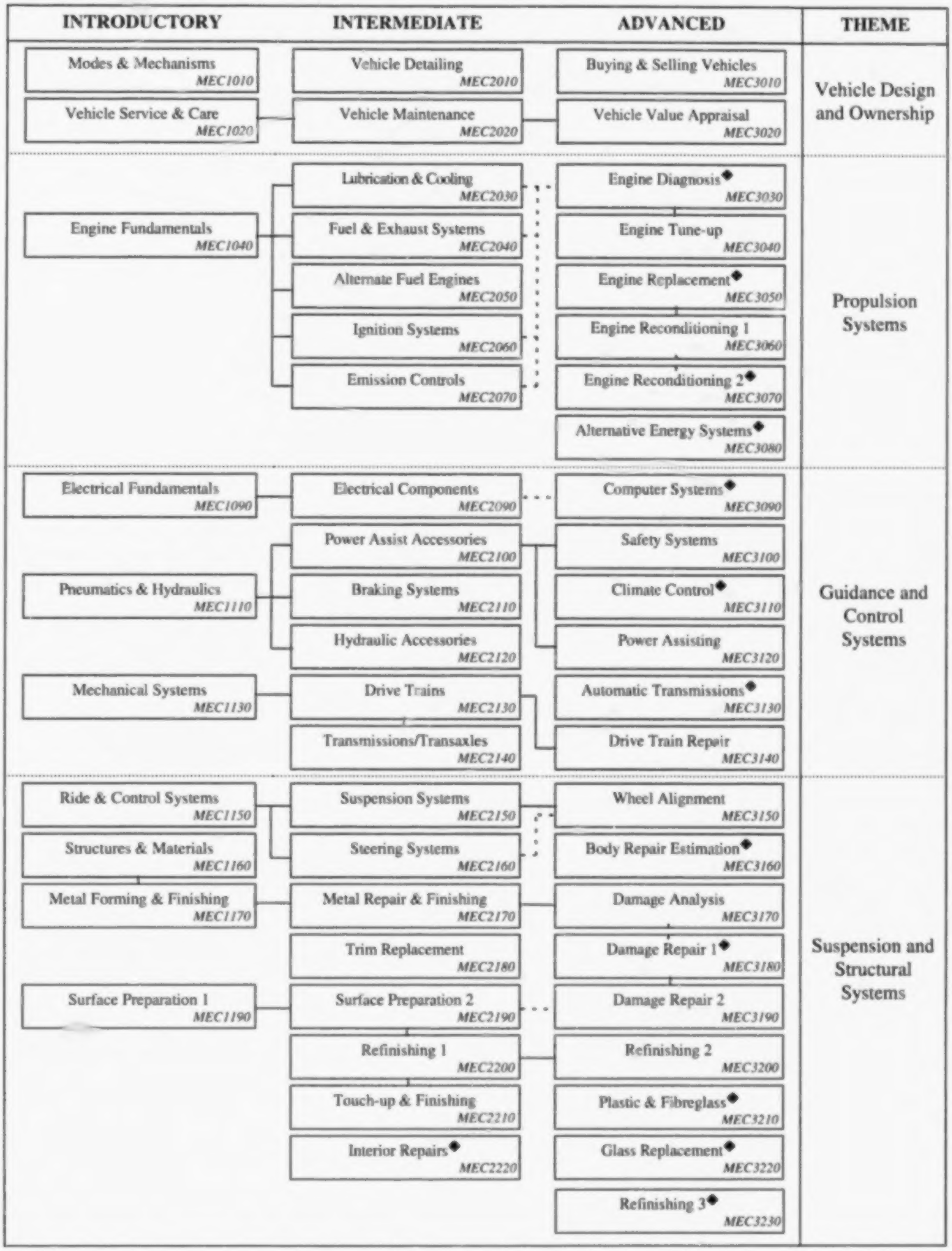
Module MAM3070: Office Systems 2
Students demonstrate effective office environment strategies and processes, use electronic office equipment, and manage processes related to electronic communications and business meetings.

Module MAM3080: Communication Strategies 3
Students continue to improve basic oral and written communications strategies necessary to efficient and effective management of information. Focus is on technical writing strategies and composing at the computer when preparing formal business reports and proposals.

Module MAM3090: Records Management 2
Students describe the advantages of an automated records system. Numeric, subject and geographic coding are emphasized.

SCOPE AND SEQUENCE

MECHANICS



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Modes & Mechanisms *MEC1010*	Vehicle Detailing *MEC2010*	Buying & Selling Vehicles *MEC3010*	Vehicle Design and Ownership
Vehicle Service & Care *MEC1020*	Vehicle Maintenance *MEC2020*	Vehicle Value Appraisal *MEC3020*	
	Lubrication & Cooling *MEC2030*	Engine Diagnosis◆ *MEC3030*	Propulsion Systems
Engine Fundamentals *MEC1040*	Fuel & Exhaust Systems *MEC2040*	Engine Tune-up *MEC3040*	
	Alternate Fuel Engines *MEC2050*	Engine Replacement◆ *MEC3050*	
	Ignition Systems *MEC2060*	Engine Reconditioning 1 *MEC3060*	
	Emission Controls *MEC2070*	Engine Reconditioning 2◆ *MEC3070*	
		Alternative Energy Systems◆ *MEC3080*	
Electrical Fundamentals *MEC1090*	Electrical Components *MEC2090*	Computer Systems◆ *MEC3090*	Guidance and Control Systems
	Power Assist Accessories *MEC2100*	Safety Systems *MEC3100*	
Pneumatics & Hydraulics *MEC1110*	Braking Systems *MEC2110*	Climate Control◆ *MEC3110*	
	Hydraulic Accessories *MEC2120*	Power Assisting *MEC3120*	
Mechanical Systems *MEC1130*	Drive Trains *MEC2130*	Automatic Transmissions◆ *MEC3130*	
	Transmissions/Transaxles *MEC2140*	Drive Train Repair *MEC3140*	
Ride & Control Systems *MEC1150*	Suspension Systems *MEC2150*	Wheel Alignment *MEC3150*	Suspension and Structural Systems
Structures & Materials *MEC1160*	Steering Systems *MEC2160*	Body Repair Estimation◆ *MEC3160*	
Metal Forming & Finishing *MEC1170*	Metal Repair & Finishing *MEC2170*	Damage Analysis *MEC3170*	
	Trim Replacement *MEC2180*	Damage Repair 1◆ *MEC3180*	
Surface Preparation 1 *MEC1190*	Surface Preparation 2 *MEC2190*	Damage Repair 2 *MEC3190*	
	Refinishing 1 *MEC2200*	Refinishing 2 *MEC3200*	
	Touch-up & Finishing *MEC2210*	Plastic & Fibreglass◆ *MEC3210*	
	Interior Repairs◆ *MEC2220*	Glass Replacement◆ *MEC3220*	
		Refinishing 3◆ *MEC3230*	

——— Prerequisite - - - - Recommended sequence

◆Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module MEC1010: Modes & Mechanism
Students research, design, build and test a model of a transportation vehicle, using a simple power source, common materials and tools.

Module MEC1020: Vehicle Service & Care
Students develop knowledge, skills and attitudes to care for and service a motor vehicle.

Module MEC1040: Engine Fundamentals
Students investigate and describe operating principles, construction and applications of engines.

Module MEC1090: Electrical Fundamentals
Students identify and describe the operating principles and applications of electricity.

Module MEC1110: Pneumatics & Hydraulics
Students identify and describe the operating principles and applications of pneumatic and hydraulic systems.

Module MEC1130: Mechanical Systems
Students identify and describe the operating principles and applications of mechanisms used to transmit and control mechanical energy.

Module MEC1150: Ride & Control Systems
Students develop a basic knowledge of ride and control systems associated with vehicles.

Module MEC1160: Structures & Materials
Students identify the types of materials and components used in vehicle construction.

Module MEC1170: Metal Forming & Finishing
Students repair and re-form damaged metal panels.

Module MEC1190: Surface Preparation 1
Students assess the state of a painted surface, and use appropriate restoration procedures.

Module MEC2010: Vehicle Detailing
Students develop the skills required to restore and enhance the exterior finishes of a vehicle.

Module MEC2020: Vehicle Maintenance
Students perform the basic service requirements necessary to ensure adequate maintenance of a motor vehicle.

Module MEC2030: Lubrication & Cooling
Students diagnose, maintain and service the lubrication and cooling systems of a typical four-cycle gasoline engine.

Module MEC2040: Fuel & Exhaust Systems
Students diagnose, maintain and service the fuel and exhaust system of a typical four-cycle gasoline engine.

Module MEC2050: Alternate Fuel Engines
Students determine alternate fuels used to power motor vehicles.

Module MEC2060: Ignition Systems
Students identify the basic components and parts of ignition systems used on internal combustion engines, and service and repair an ignition system.

Module MEC2070: Emission Controls
Students describe the importance of controlling emissions and the technology applied to vehicles to meet prescribed standards.

Module MEC2090: Electrical Components
Students identify and describe the basic use and testing of the electrical components of a typical motor vehicle.

Module MEC2100: Power Assist Accessories
Students identify and explain the function of components and parts of power assist accessories.

Module MEC2110: Braking Systems
Students develop the necessary knowledge, skills and attitudes to diagnose, service and maintain a braking system according to accepted trade practices.

Module MEC2120: Hydraulic Accessories
Students develop a basic knowledge of hydraulic components, applications and servicing techniques.

Module MEC2130: Drive Trains
Students identify the purpose, describe the operation and perform the servicing of a vehicle drive train.

Module MEC2140: Transmissions/Transaxles
Students perform inspection service and repair procedures on manual transmissions, transaxles and clutch assemblies.

Module MEC2150: Suspension Systems
Students develop the knowledge, skills and attitudes necessary to service and maintain vehicle suspension systems.

Module MEC2160: Steering Systems
Students develop the knowledge, skills and attitudes necessary to maintain a steering system.

Module MEC2170: Metal Repair & Finishing
Students analyze and repair metal damage.

Module MEC2180: Trim Replacement
Students demonstrate the removal and repair of trim parts, with an emphasis on removal and installation without damage.

Module MEC2190: Surface Preparation 2
Students perform advanced surface preparations.

Module MEC2200: Refinishing 1
Students demonstrate metal surface refinishing procedures.

Module MEC2210: Touch-up & Finishing
Students determine and use the appropriate materials, tools and processes for minor surface repairs.

Module MEC2220: Interior Repairs
Students search for and use the appropriate products and techniques to maintain vehicle interior surface materials.

Module MEC3010: Buying & Selling Vehicles
Students develop the skills required to make an informed purchase or sale of a vehicle.

Module MEC3020: Vehicle Value Appraisal
Students demonstrate the procedures used by industry to estimate the cost of a repair and the market value of a vehicle.

Module MEC3030: Engine Diagnosis
Students learn to diagnose the condition of an engine for worn or damaged parts and/or improper adjustments.

Module MEC3040: Engine Tune-up
Students diagnose, service and repair engine, fuel, ignition, charging and starting systems.

Module MEC3050: Engine Replacement
Students remove and install an engine in a chassis.

Module MEC3060: Engine Reconditioning 1
Students determine the need for service, and perform the required service, on the cylinder head and related components of an engine.

Module MEC3070: Engine Reconditioning 2
Students determine the need for service, and perform service, on a cylinder block assembly and related components of an engine.

Module MEC3080: Alternative Energy Systems
Students describe why vehicle manufacturers continue to build the crank-piston internal combustion gasoline engine. Students also identify and describe future engine designs.

Module MEC3090: Computer Systems
Students provide an overview of the applications of computer management systems used in modern vehicles.

Module MEC3100: Safety Systems
Students describe how safety systems can be tested, diagnosed, replaced or repaired.

Module MEC3110: Climate Control
Students expand their knowledge of the purpose, operation and servicing of standard heating and air conditioning systems.

Module MEC3120: Power Assisting
Students further develop their knowledge of the purpose, operation, service and repair of pneumatic, hydraulic and electric power assist devices.

Module MEC3130: Automatic Transmissions
Students develop knowledge of automatic transmissions and transaxles, and skills in diagnosing and executing minor automatic transmission and transaxle repair requirements.

Module MEC3140: Drive Train Repair
Students perform overhauls on clutch, transmission and differential assemblies.

Module MEC3150: Wheel Alignment
Students develop the knowledge, skills and attitudes necessary for repairing and aligning various vehicle steering systems.

Module MEC3160: Body Repair Estimation
Students apply knowledge in estimating, including close attention to detail in determining the cost of a repair.

Module MEC3170: Damage Analysis
Students identify and examine physical damage caused by collisions, and learn cost estimating procedures.

Module MEC3180: Damage Repair 1
Students examine the methods used to complete a repair involving removing, replacing and aligning of body parts.

Module MEC3190: Damage Repair 2
Students examine methods used to complete a collision repair involving unibody parts replacement and frame correction.

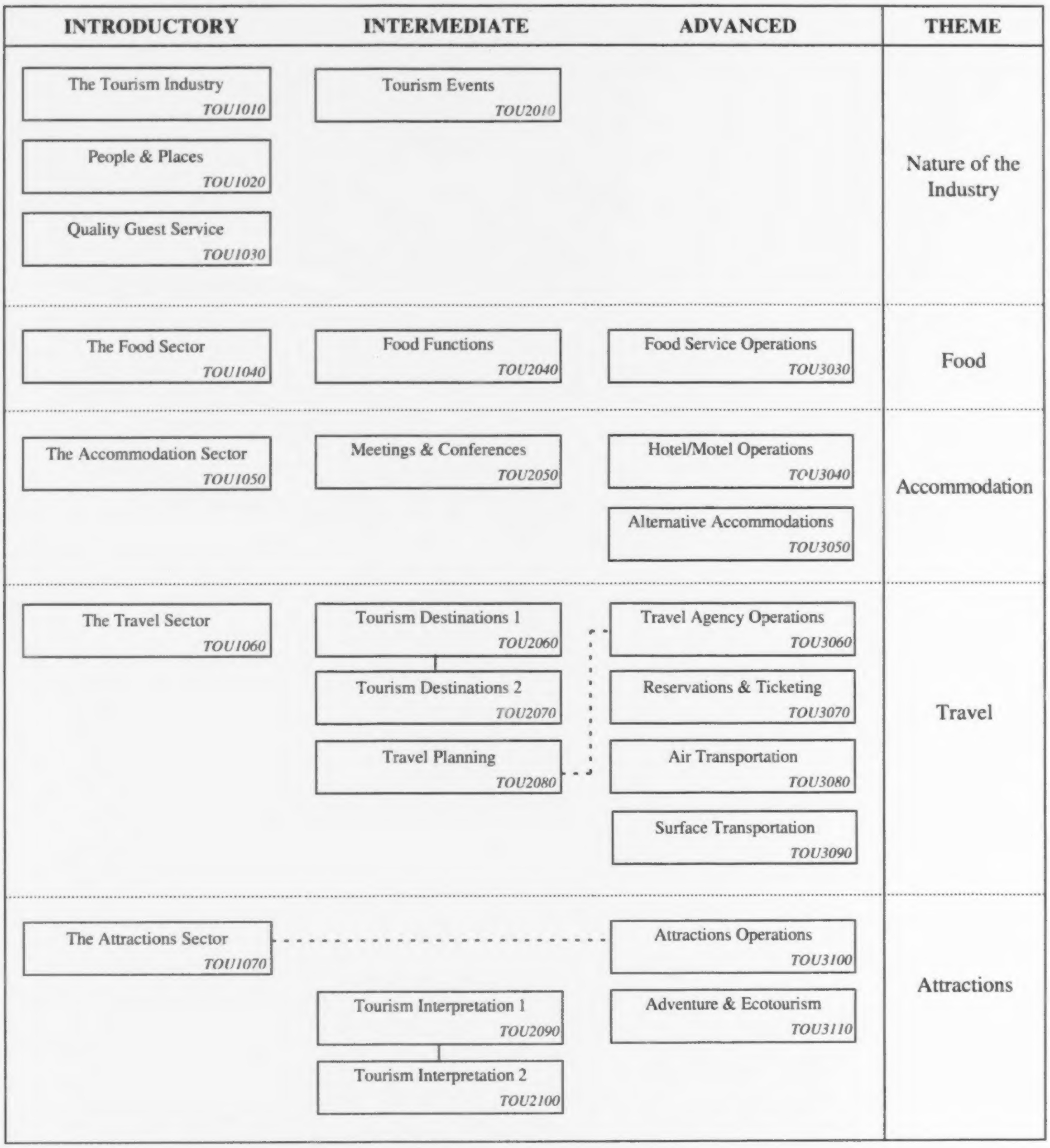
Module MEC3200: Refinishing 2
Students demonstrate finishing skills and techniques related to the preparation and application of metallic paints.

Module MEC3210: Plastic & Fibreglass
Students determine the types of plastic and fibreglass materials required for repairs, and perform appropriate repair procedures.

Module MEC3220: Glass Replacement
Students demonstrate knowledge, skills and practice related to vehicle glass installation and adjustment.

Module MEC3230: Refinishing 3
Students demonstrate knowledge and skills of advanced finishing techniques, including custom painting, mixing, tinting, colour and texture matching.

SCOPE AND SEQUENCE TOURISM STUDIES



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
The Tourism Industry *TOU1010*	Tourism Events *TOU2010*		Nature of the Industry
People & Places *TOU1020*			
Quality Guest Service *TOU1030*			
The Food Sector *TOU1040*	Food Functions *TOU2040*	Food Service Operations *TOU3030*	Food
The Accommodation Sector *TOU1050*	Meetings & Conferences *TOU2050*	Hotel/Motel Operations *TOU3040*	Accommodation
		Alternative Accommodations *TOU3050*	
The Travel Sector *TOU1060*	Tourism Destinations 1 *TOU2060*	Travel Agency Operations *TOU3060*	Travel
	Tourism Destinations 2 *TOU2070*	Reservations & Ticketing *TOU3070*	
	Travel Planning *TOU2080*	Air Transportation *TOU3080*	
		Surface Transportation *TOU3090*	
The Attractions Sector *TOU1070*		Attractions Operations *TOU3100*	Attractions
	Tourism Interpretation 1 *TOU2090*	Adventure & Ecotourism *TOU3110*	
	Tourism Interpretation 2 *TOU2100*		

——— Prerequisite

- - - - Recommended sequence

MODULE DESCRIPTIONS

Module TOU1010: The Tourism Industry
Students analyze the organizational structure of the tourism industry at local and provincial levels, and investigate employment opportunities in tourism.

Module TOU1020: People & Places
Students design strategies for maintaining and enhancing the well-being of tourists, including individuals and groups, such as families. Students also design strategies for preserving the cultural and environmental heritage of a tourism area.

Module TOU1030: Quality Guest Service
Students demonstrate the knowledge, skills and attitudes of quality guest service, including hospitality, effective communication and workplace safety.

Module TOU1040: The Food Sector
Students evaluate food service establishments, explain basic food-handling principles, demonstrate satisfactory food service skills and adapt service standards to meet the needs of guests.

Module TOU1050: The Accommodation Sector
Students research accommodation options available, discuss basic principles of the accommodations industry, and develop service strategies for handling individual guest requirements.

Module TOU1060: The Travel Sector
Students research a variety of travel services, demonstrate basic travel information and promotion skills, and investigate career opportunities in providing travel information.

Module TOU1070: The Attractions Sector
Students analyze and compare the natural, cultural and recreational attractions available in Alberta, develop strategies to maintain the well-being of guests, and investigate employment opportunities in the attractions sector.

Module TOU2010: Tourism Events
Students plan, organize, facilitate and evaluate a tourism event in the school or community.

Module TOU2040: Food Functions
Students demonstrate the knowledge and skills of serving food for a food function that they have planned in order to meet the needs of a client.

Module TOU2050: Meetings & Conferences
Students develop a meeting plan, facilitate and evaluate the success of the meeting plan, and investigate career opportunities in meeting and conference planning.

Module TOU2060: Tourism Destinations 1
Students demonstrate knowledge of world tourism geography, by presenting travel information about North America and at least one other world region.

Module TOU2070: Tourism Destinations 2
Students demonstrate knowledge of world tourism geography, by presenting travel information about at least four major tourism regions of the world.

Module TOU2080: Travel Planning
Students create and evaluate an Alberta tour package and an international travel package, including itinerary, tour and attractions information, and traveller information.

Module TOU2090: Tourism Interpretation 1
Students evaluate the different types of interpretive media and demonstrate the basic skills of an information attendant, by conducting an interpretation program for a tourism activity.

Module TOU2100: Tourism Interpretation 2
Students create, implement and evaluate interpretation programs for conducted and nonconducted activities. Students also demonstrate the skills of an effective leader in a conducted activity.

Module TOU3030: Food Service Operations
Students relate trends and issues in food service to industry activity, design food service strategies, and present a marketing or venture plan for a food service business.

Module TOU3040: Hotel/Motel Operations
Students demonstrate correct check-in and check-out procedures, research the organization of a large hotel, analyze hotel marketing strategies, and present a marketing plan for a hotel department.

Module TOU3050: Alternative Accommodations
Students research and discuss issues related to alternative accommodations, develop a service strategy and standards, and present a marketing or venture plan for an alternative accommodation business.

Module TOU3060: Travel Agency Operations
Students research the operation of a travel agency and the role and work activities of a travel agent. Students also present a marketing plan for a travel agency.

Module TOU3070: Reservations & Ticketing
Students process travel reservations, using a computer reservation system, develop an itinerary, and provide the traveller with information related to the itinerary/destination.

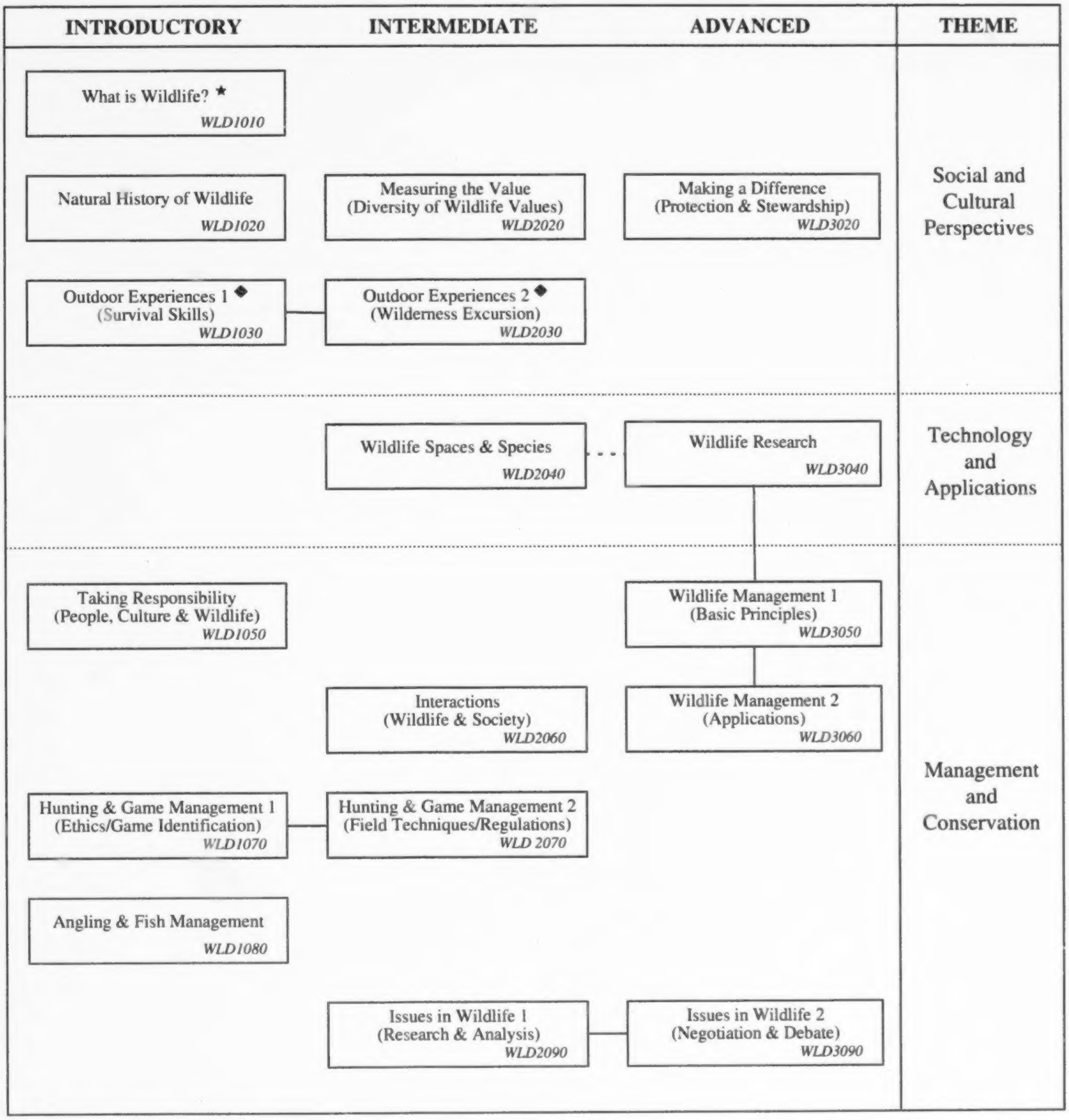
Module TOU3080: Air Transportation
Students research and report on the organization and operation of a major airline. Students also present a marketing plan for an airline.

Module TOU3090: Surface Transportation
Students research the business operations and career opportunities of the rail, motor coach, auto and cruise travel industries. Students also present a variety of marketing strategies for a transportation industry.

Module TOU3100: Attractions Operations
Students analyze the economic, social, cultural and environmental impact of attractions operations. Students also present a marketing plan for an attractions development.

Module TOU3110: Adventure & Ecotourism
Students analyze the economic, social and environmental factors that influence the development plan for an adventure or ecotourism venture. Students also compare management issues for different types of recreation areas.

SCOPE AND SEQUENCE WILDLIFE



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
What is Wildlife? ★ *WLD1010*			Social and Cultural Perspectives
Natural History of Wildlife *WLD1020*	Measuring the Value (Diversity of Wildlife Values) *WLD2020*	Making a Difference (Protection & Stewardship) *WLD3020*	
Outdoor Experiences 1 ◆ (Survival Skills) *WLD1030*	Outdoor Experiences 2 ◆ (Wilderness Excursion) *WLD2030*		
	Wildlife Spaces & Species *WLD2040*	Wildlife Research *WLD3040*	Technology and Applications
Taking Responsibility (People, Culture & Wildlife) *WLD1050*		Wildlife Management 1 (Basic Principles) *WLD3050*	Management and Conservation
	Interactions (Wildlife & Society) *WLD2060*	Wildlife Management 2 (Applications) *WLD3060*	
Hunting & Game Management 1 (Ethics/Game Identification) *WLD1070*	Hunting & Game Management 2 (Field Techniques/Regulations) *WLD 2070*		
Angling & Fish Management *WLD1080*			
	Issues in Wildlife 1 (Research & Analysis) *WLD2090*	Issues in Wildlife 2 (Negotiation & Debate) *WLD3090*	

——— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
◆ Refer to specific modules for additional prerequisites.

MODULE DESCRIPTIONS

Module WLD1010: What is Wildlife?
Students demonstrate knowledge of wildlife and ecosystems, and examine the need to manage and conserve wildlife.

Module WLD1020: Natural History of Wildlife
Students investigate the diversity of Canadian wildlife in terms of structure, behaviour and habitat, and compare Alberta wildlife with wildlife in other parts of the world.

Module WLD1030: Outdoor Experiences 1 (Survival Skills)
Students demonstrate the basic skills required for responsible participation in a range of outdoor activities.

Module WLD1050: Taking Responsibility (People, Culture & Wildlife)
Students explain the significance of wildlife in society, examine relationships among humans and wildlife, and research potential career opportunities in wildlife-related fields.

Module WLD1070: Hunting & Game Management 1 (Ethics/Game Identification)
Students explain the role of regulated hunting in game management, identify Alberta's game animals, and demonstrate knowledge and skills that ensure safe and comfortable experiences in the outdoors.

Module WLD1080: Angling & Fish Management
Students explain the role of recreational fishing in the management and conservation of fish resources, and demonstrate knowledge of the responsible practices required for fishing or related outdoor activities.

Module WLD2020: Measuring the Value (Diversity of Wildlife Values)
Students assess the significance of wildlife in society, analyze relationships between humans and wildlife, and research career opportunities in wildlife-related fields.

Module WLD2030: Outdoor Experiences 2 (Wilderness Excursion)
Students plan, prepare for and conduct an extended outdoor wilderness trip.

Module WLD2040: Wildlife Spaces & Species
Students present the results of research on wildlife spaces and species in Alberta and other parts of the world, and compare different strategies used in wildlife management.

Module WLD2060: Interactions (Wildlife & Society)
Students explain how human populations interact with wildlife, and describe management strategies that enable wildlife and society to coexist.

Module WLD2070: Hunting & Game Management 2 (Field Techniques/Regulations)
Students demonstrate knowledge of the basic parts and safe handling of bows, arrows and firearms, and explain the legal responsibilities of the sports person.

Module WLD2090: Issues in Wildlife 1 (Research & Analysis)
Students examine a range of Canadian and global wildlife issues, and present the results of research on one or more issues concerning wildlife in Canada.

Module WLD3020: Making a Difference (Protection & Stewardship)
Students explain how human populations and wildlife affect each other, describe management strategies that enable humans and wildlife to coexist, and demonstrate individual and shared actions that foster environmental stewardship.

Module WLD3040: Wildlife Research
Students explain applications of the wildlife research process, and conduct experimental research on a wildlife space or species.

Module WLD3050: Wildlife Management 1 (Basic Principles)
Students describe the functions and processes of wildlife management, and identify issues that may affect the development of a wildlife management plan.

Module WLD3060: Wildlife Management 2 (Applications)
Students develop and present a plan for managing a wildlife space or species.

Module WLD3090: Issues in Wildlife 2 (Negotiation & Debate)
Students examine the complexity of wildlife issues affecting Alberta and the rest of the world, and demonstrate individual and shared actions that foster sustainable management of wildlife.

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 2:

Tracking and Reporting Student Achievement in CTS

August 1997 (Interim)

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Questions or comments about this Manual for Administrators, Counsellors and Teachers are welcomed and should be directed to:

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Telephone: (403) 422–4872*, Fax: (403) 422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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- C. 1997–98 School Term: Revised Procedures for Reporting Student Achievement 2

II. Directions for Tracking and Reporting Student Achievement in CTS to Alberta Education when **"Bundling"** Modules 3

III. Directions for Tracking and Reporting Student Achievement in CTS to Alberta Education when Reporting **"Individual"** Modules 13

I. TRACKING AND REPORTING STUDENT ACHIEVEMENT IN CTS

A. *Why is tracking and reporting student achievement a challenge in CTS?*

Present computerized student record systems, both school-based and provincial, are organized around courses and grades and link students to a specific time block and location. CTS is a competency-based (not time based) curriculum that is organized around modules ("chunks" of learning smaller than courses) and uses a levels (not grade) approach. As a competency-based curriculum, only passed modules are reported on a student's transcript.

B. *What are the benefits to reporting student achievement at the modular level?*

When schools report only modules successfully completed, Alberta Education makes a significant improvement in ensuring student transcripts reflect what students know and are able to do. This strategy can be positive for students, schools and school systems, teachers, post-secondary institutions and potential employers and the workplace.

Students

When students know they must meet all of the expectations for the module to earn a credit, they tend to rise to the challenge and focus their efforts more efficiently and effectively.

Many students find smaller chunks of learning more attainable and are more motivated when they can focus on meeting the expectations for an individual module rather than 3- or 5-credit courses.

Increased flexibility and high expectations encourage students to take more responsibility for managing their own learning. (Many CTS students now negotiate which strands/modules they would like to take.)

Schools/School Systems

Reporting at the module level can provide schools more flexibility in how and when modules can be delivered; consequently schools can be more successful in expanding students' learning opportunities and helping them achieve success.

Post-secondary Institutions

Standards of student competency when entering post-secondary programs will be higher and more clearly described through the transcripts.

With increased confidence that the standards and competencies are appropriate, post-secondary institutions are recognizing CTS:

- as an entry requirement
- for advanced standing
- for advanced credit.

Students entering related post-secondary-programs having completed designated modules will:

- have a sound basis for further learning
- are less likely to drop out
- have a clearer understanding and commitment of the upcoming demands in performance, work environment.

Potential Employers/Workplace

Standards of student competency when applying for entry into the workplace will be more clearly described through the transcripts.

Students will have a better idea of how to market themselves as they will have a better idea of their potential and what they know and can already do well.

C. *1997-98 School Term: Procedures for Reporting Student Achievement*

Alberta Education has modified its computer applications and is prepared to accept reports of student achievement at the module level. Changes in the electronic file specifications were communicated to school authorities and vendors of student records software in January, 1997. However, an additional year has been granted to make changes to automated student records systems. For the 1997 - 98 school term, schools and school systems have a choice in reporting student achievement. You may either use existing procedures and student records software and report student achievement by:

"Bundling" modules into courses,
- using the old four-digit course codes; and
- completing separate forms to adjust credit enrollment funding for:
  - challenged modules (Form 94ED01.04A),
  - incomplete (failed) modules (Form 94ED01.04B)
  - modules completed in junior high school (Form 94ED01.04C)

The procedures for reporting student achievement when "Bundling" modules are outlined in Section II.: Directions for Tracking and Reporting Student Achievement in CTS to Alberta Education: Bundling Modules. Copies of the funding forms are available in "Funding for School Authorities in the 1996–97 School Year: A Manual for School Jurisdictions, Private Schools and Private ECS Operators"

OR

you may upgrade your student records software, implement new procedures, and report student achievement by:

Reporting individual modules
- adopting the new 7 digit, alpha-numeric course
- including additional fields such as:
  - course completion method
  - course completion status
  - course completion funding,
  - course completion external credential, and
  - primary delivery method.

The procedures for reporting student achievement for individual CTS modules and the new seven digit, alpha-numeric course codes are provided in Section III: Directions for Tracking Student Achievement in CTS to Alberta Education when Reporting "Individual" Modules.

Details of the new data collection files and values for these fields were communicated in a document, "Electronic Data Exchanger User Guide" sent to each school reporting high school achievement in June, 1997. This document and the "Electronic Data File Specifications" are available on the Internet at **http://ednet.edc.gov.ab.ca/technology**.

II. DIRECTIONS FOR TRACKING AND REPORTING STUDENT ACHIEVEMENT IN CAREER AND TECHNOLOGY STUDIES TO ALBERTA EDUCATION:

TO BE USED WHEN REPORTING BY "**BUNDLING**" MODULES

Alberta Education has modified its computer applications and is prepared to accept reports of student achievement at the module level. Changes in the electronic file specifications were communicated to school authorities and vendors of student records software in January, 1997. However, an additional year has been granted to make changes to automated student records systems. For the 1997 - 98 school term, schools and school systems have a choice in reporting student achievement. You may report student achievement by:

- "**Bundling**" Modules (as described below), **OR**
- "**Individual**" Modules (as described in Section III: Directions for Tracking and Reporting Student Achievement in CTS to Alberta Government when Reporting "Individual" Modules.)

A. SCHOOLS DESIGN COURSES

1. The CTS curriculum structure allows teachers and schools in design courses by combining 1-credit modules:
   - within and across strands, and
   - within and across levels (introductory, intermediate and advanced).
2. Schools will design courses composed of modules. Guidelines for module sequences, facility and equipment, and instructional qualifications are provided in the *Guide to Standards and Implementation* for each strand.

B. STUDENT ACHIEVEMENT REPORTED TO ALBERTA EDUCATION BY "BUNDLING" MODULES

1. To successfully complete a module, a student must demonstrate all of the module learner expectations to the established standard as outlined in the strand *Guide to Standards and Implementation*.
2. A mark of 50% or higher will be given for each module successfully completed. Schools will report to the Educational Information Exchange only the courses, i.e., combinations of modules, in which students have successfully demonstrated the competencies defined for the module. No failures or incompletes would be reported.

   Note: Modules that students have attempted and not successfully completed should be reported to School Finance and Facilities Branch on the "Report of Senior High Student Career and Technology Studies (CTS) Incomplete (Failed) Modules." For further information, contact the School Finance and Facilities Branch.
3. Course marks are to be reported in the same manner as is used for other courses. The mark submitted for a course is to be the average of the percentage marks given for each module that has been completed successfully.
4. Course codes and course names have been established for 1, 2, 3, 4, 5 and 6 credits for CTS and for each strand. Schools are to use the most appropriate course codes when reporting student achievement at the end of the school terms. A second set of 3- and 5-credit course codes at the introductory and intermediate levels and two, 5-credit course codes at the advanced level have been added. This has been done in only those strands where schools might offer more modules than can be accommodated by one, 3- or 5-credit course code combination. The new 3- and 5-credit course codes can also help in timetabling.

   One- and 2-credit course codes may not be used to schedule students in courses. They should be used only when a student does not complete enough modules *over the full school year* to form a 3-, 4-, 5- or 6-credit course. They should be reported to **Educational Information Exchange** only in June, at the end of the school year, unless a student leaves the school during the school year.

Note: As the capacity of the computer system and number of 1-credit course codes are both limited, 1-credit modules are to be combined into 2-credit courses rather than two, separate 1-credit courses.

5. If a student has completed 7, 8, 9 or 10 modules, the school could report that student's achievement by using two course codes. For example, 8 modules successfully completed in Tourism Studies could be reported as Tourism Studies 2A (3 credits) and Tourism Studies 2C (5 credits).

6. A student may obtain credit for a given course code only once. If a situation arises where a student would need to use the same course code twice (e.g., the student has taken an introductory level 3-credit course in the first semester and another introductory level 3-credit course in the second semester but with completely different modules), the school could:

   - total the credits and use that course code; e.g., two, 3-credit courses could be reported as a 6-credit course. If the first 3-credit course has already been reported to Alberta Education, the school would need to forward a course correction to **Educational Information Exchange**
   - bank the second set of modules until another course code could be used.

7. CTS course codes and course names identify course title, number of credits (modules) in the course and the course level. For example:

Course Code Series	Course Name	Course Title	Course Level	Course Credit
4503	Career and Technology Studies 1A	Career and Technology Studies	1 (Introductory level)	A (3 credits)
5564	Tourism Studies 2B	Tourism Studies	2 (Intermediate level)	B (4 credits)
6635	Enterprise and Innovation 3C	Enterprise and Innovation	3 (Advanced level)	C (5 credits)

Course Title

- Use "Strand Name," if the majority of the modules are from one strand.

  For example, course name is Tourism Studies (3 credits) when there is one module from Enterprise and Innovation and two modules from Tourism Studies.

- Otherwise, use "Career and Technology Studies."

  For example, the course name is Career and Technology Studies (4 credits) when there are two modules from Enterprise and Innovation and two modules from Tourism Studies.

Number of Credits

Each module, successfully completed, qualifies for 1 credit. The course name is to include a reference to the number of credits:

1 credit – "E" (or "J")
2 credits – "F" (or "K")
3 credits – "A" (or "G")
4 credits – "B"
5 credits – "C" (or "G"★, "H")
6 credits – "D"

★ only at advanced levels

Course Level

Courses with modules primarily at the:

- introductory level are designated at the "**1**" level
- intermediate level are designated at the "**2**" level
- advanced level are designated at the "**3**" level.

Refer to the following Course Configuration Charts to determine if a course should be designated as "1" level, "2" level, or "3" level when modules in a course come from more than one level (introductory, intermediate, advanced).

Level "3" courses may be used to meet the Alberta High School Diploma requirements for 10 credits at the 30 level.

COURSE CONFIGURATION CHARTS

THREE-MODULE COURSE (3 credits)

	No. Modules at Each Level		
Course Level	Intro.	Interm.	Adv.
1	3	0	0
1	2	1	0
1	2	0	1
2	1	2	0
2	1	1	1
2	0	3	0
2	0	2	1
3	1	0	2
3	0	1	2
3	0	0	3

FOUR-MODULE COURSE (4 credits)

	No. Modules at Each Level		
Course Level	Intro.	Interm.	Adv.
1	4	0	0
1	3	1	0
2	3	0	1
2	2	2	0
2	2	1	1
2	2	0	2
2	1	3	0
2	1	2	1
2	0	4	0
2	0	3	1
3	1	1	2
3	1	0	3
3	0	2	2
3	0	1	3
3	0	0	4

FIVE-MODULE COURSE (5 credits)

	No. Modules at Each Level		
Course Level	Intro.	Interm.	Adv.
1	5	0	0
1	4	1	0
1	4	0	1
1	3	2	0
1	3	1	1
1	3	0	2
2	2	3	0
2	2	2	1
2	2	1	2
2	1	4	0
2	1	3	1
2	1	2	2
2	0	5	0
2	0	4	1
2	0	3	2
3	2	0	3
3	1	1	3
3	1	0	4
3	0	2	3
3	0	1	4
3	0	0	5

SIX-MODULE COURSE (6 credits)

	No. Modules at Each Level		
Course Level	Intro.	Interm.	Adv.
1	6	0	0
1	5	1	0
1	5	0	1
1	4	2	0
1	4	1	1
1	4	0	2
2	3	3	0
2	3	2	1
2	3	1	2
2	3	0	3
2	2	4	0
2	2	3	1
2	2	2	2
2	2	1	3
2	1	5	0
2	1	4	1
2	1	3	2
2	1	2	3
2	0	6	0
2	0	5	1
2	0	4	2
3	2	0	4
3	1	1	4
3	1	0	5
3	0	3	3
3	0	2	4
3	0	1	5
3	0	0	6

CAREER AND TECHNOLOGY STUDIES

COURSE CODES♠

TO BE USED WHEN REPORTING BY "BUNDLING" MODULES

CAREER AND TECHNOLOGY STUDIES

4501	Career and Technology Studies 1E	(1)	5501	Career and Technology Studies 2E	(1)	6501	Career and Technology Studies 3E	(1)
4502	Career and Technology Studies 1F	(2)	5502	Career and Technology Studies 2F	(2)	6502	Career and Technology Studies 3F	(2)
4503	Career and Technology Studies 1A	(3)	5503	Career and Technology Studies 2A	(3)	6503	Career and Technology Studies 3A	(3)
4504	Career and Technology Studies 1B	(4)	5504	Career and Technology Studies 2B	(4)	6504	Career and Technology Studies 3B	(4)
4505	Career and Technology Studies 1C	(5)	5505	Career and Technology Studies 2C	(5)	6505	Career and Technology Studies 3C	(5)
4506	Career and Technology Studies 1D	(6)	5506	Career and Technology Studies 2D	(6)	6506	Career and Technology Studies 3D	(6)
4507	Career and Technology Studies 1G	(3)	5507	Career and Technology Studies 2G	(3)	6507	Career and Technology Studies 3G	(5)
4508	Career and Technology Studies 1H	(5)	5508	Career and Technology Studies 2H	(5)	6508	Career and Technology Studies 3H	(5)
4509	Career and Technology Studies 1J	(1)	5509	Career and Technology Studies 2J	(1)	6509	Career and Technology Studies 3J	(1)
4510	Career and Technology Studies 1K	(2)	5510	Career and Technology Studies 2K	(2)	6510	Career and Technology Studies 3K	(2)

AGRICULTURE

4701	Agriculture 1E	(1)	5701	Agriculture 2E	(1)	6701	Agriculture 3E	(1)
4702	Agriculture 1F	(2)	5702	Agriculture 2F	(2)	6702	Agriculture 3F	(2)
4703	Agriculture 1A	(3)	5703	Agriculture 2A	(3)	6703	Agriculture 3A	(3)
4704	Agriculture 1B	(4)	5704	Agriculture 2B	(4)	6704	Agriculture 3B	(4)
4705	Agriculture 1C	(5)	5705	Agriculture 2C	(5)	6705	Agriculture 3C	(5)
4706	Agriculture 1D	(6)	5706	Agriculture 2D	(6)	6706	Agriculture 3D	(6)
4707	Agriculture 1G	(3)	5707	Agriculture 2G	(3)	6707	Agriculture 3G	(5)
4708	Agriculture 1H	(5)	5708	Agriculture 2H	(5)	6708	Agriculture 3H	(5)
4709	Agriculture 1J	(1)	5709	Agriculture 2J	(1)	6709	Agriculture 3J	(1)
4710	Agriculture 1K	(2)	5710	Agriculture 2K	(2)	6710	Agriculture 3K	(2)

CAREER TRANSITIONS

4571	Career Transitions 1E	(1)	5571	Career Transitions 2E	(1)	6571	Career Transitions 3E	(1)
4572	Career Transitions 1F	(2)	5572	Career Transitions 2F	(2)	6572	Career Transitions 3F	(2)
4573	Career Transitions 1A	(3)	5573	Career Transitions 2A	(3)	6573	Career Transitions 3A	(3)
4574	Career Transitions 1B	(4)	5574	Career Transitions 2B	(4)	6574	Career Transitions 3B	(4)
4575	Career Transitions 1C	(5)	5575	Career Transitions 2C	(5)	6575	Career Transitions 3C	(5)
4576	Career Transitions 1D	(6)	5576	Career Transitions 2D	(6)	6576	Career Transitions 3D	(6)
4579	Career Transitions 1J	(1)	5579	Career Transitions 2J	(1)	6579	Career Transitions 3J	(1)
4580	Career Transitions 1K	(2)	5580	Career Transitions 2K	(2)	6580	Career Transitions 3K	(2)

♠ Please refer to the attached Section II: "Directions for Reporting Student Achievement in CTS to Alberta Education when 'Bundling' Modules" to determine which course code should be used when reporting student achievement to Alberta Education.

COMMUNICATION TECHNOLOGY

4581	Communication Technology 1E	(1)	5581	Communication Technology 2E	(1)	6581	Communication Technology 3E	(1)
4582	Communication Technology 1F	(2)	5582	Communication Technology 2F	(2)	6582	Communication Technology 3F	(2)
4583	Communication Technology 1A	(3)	5583	Communication Technology 2A	(3)	6583	Communication Technology 3A	(3)
4584	Communication Technology 1B	(4)	5584	Communication Technology 2B	(4)	6584	Communication Technology 3B	(4)
4585	Communication Technology 1C	(5)	5585	Communication Technology 2C	(5)	6585	Communication Technology 3C	(5)
4586	Communication Technology 1D	(6)	5586	Communication Technology 2D	(6)	6586	Communication Technology 3D	(6)
4587	Communication Technology 1G	(3)	5587	Communication Technology 2G	(3)	6587	Communication Technology 3G	(5)
4588	Communication Technology 1H	(5)	5588	Communication Technology 2H	(5)	6588	Communication Technology 3H	(5)
4589	Communication Technology 1J	(1)	5589	Communication Technology 2J	(1)	6589	Communication Technology 3J	(1)
4590	Communication Technology 1K	(2)	5590	Communication Technology 2K	(2)	6590	Communication Technology 3K	(2)

COMMUNITY HEALTH

4541	Community Health 1E	(1)	5541	Community Health 2E	(1)	6541	Community Health 3E	(1)
4542	Community Health 1F	(2)	5542	Community Health 2F	(2)	6542	Community Health 3F	(2)
4543	Community Health 1A	(3)	5543	Community Health 2A	(3)	6543	Community Health 3A	(3)
4544	Community Health 1B	(4)	5544	Community Health 2B	(4)	6544	Community Health 3B	(4)
4545	Community Health 1C	(5)	5545	Community Health 2C	(5)	6545	Community Health 3C	(5)
4546	Community Health 1D	(6)	5546	Community Health 2D	(6)	6546	Community Health 3D	(6)
4547	Community Health 1G	(3)	5547	Community Health 2G	(3)	6547	Community Health 3G	(5)
4548	Community Health 1H	(5)	5548	Community Health 2H	(5)	6548	Community Health 3H	(5)
4549	Community Health 1J	(1)	5549	Community Health 2J	(1)	6549	Community Health 3J	(1)
4550	Community Health 1K	(2)	5550	Community Health 2K	(2)	6550	Community Health 3K	(2)

CONSTRUCTION TECHNOLOGIES

4651	Construction Technologies 1E	(1)	5651	Construction Technologies 2E	(1)	6651	Construction Technologies 3E	(1)
4652	Construction Technologies 1F	(2)	5652	Construction Technologies 2F	(2)	6652	Construction Technologies 3F	(2)
4653	Construction Technologies 1A	(3)	5653	Construction Technologies 2A	(3)	6653	Construction Technologies 3A	(3)
4654	Construction Technologies 1B	(4)	5654	Construction Technologies 2B	(4)	6654	Construction Technologies 3B	(4)
4655	Construction Technologies 1C	(5)	5655	Construction Technologies 2C	(5)	6655	Construction Technologies 3C	(5)
4656	Construction Technologies 1D	(6)	5656	Construction Technologies 2D	(6)	6656	Construction Technologies 3D	(6)
4657	Construction Technologies 1G	(3)	5657	Construction Technologies 2G	(3)	6657	Construction Technologies 3G	(5)
4658	Construction Technologies 1H	(5)	5658	Construction Technologies 2H	(5)	6658	Construction Technologies 3H	(5)
4659	Construction Technologies 1J	(1)	5659	Construction Technologies 2J	(1)	6659	Construction Technologies 3J	(1)
4660	Construction Technologies 1K	(2)	5660	Construction Technologies 2K	(2)	6660	Construction Technologies 3K	(2)

COSMETOLOGY

4511	Cosmetology 1E	(1)	5511	Cosmetology 2E	(1)	6511	Cosmetology 3E	(1)
4512	Cosmetology 1F	(2)	5512	Cosmetology 2F	(2)	6512	Cosmetology 3F	(2)
4513	Cosmetology 1A	(3)	5513	Cosmetology 2A	(3)	6513	Cosmetology 3A	(3)
4514	Cosmetology 1B	(4)	5514	Cosmetology 2B	(4)	6514	Cosmetology 3B	(4)
4515	Cosmetology 1C	(5)	5515	Cosmetology 2C	(5)	6515	Cosmetology 3C	(5)
4516	Cosmetology 1D	(6)	5516	Cosmetology 2D	(6)	6516	Cosmetology 3D	(6)
4517	Cosmetology 1G	(3)	5517	Cosmetology 2G	(3)	6517	Cosmetology 3G	(5)
4518	Cosmetology 1H	(5)	5518	Cosmetology 2H	(5)	6518	Cosmetology 3H	(5)
4519	Cosmetology 1J	(1)	5519	Cosmetology 2J	(1)	6519	Cosmetology 3J	(1)
4520	Cosmetology 1K	(2)	5520	Cosmetology 2K	(2)	6520	Cosmetology 3K	(2)

DESIGN STUDIES

4621	Design Studies 1E	(1)	5621	Design Studies 2E	(1)	6621	Design Studies 3E	(1)
4622	Design Studies 1F	(2)	5622	Design Studies 2F	(2)	6622	Design Studies 3F	(2)
4623	Design Studies 1A	(3)	5623	Design Studies 2A	(3)	6623	Design Studies 3A	(3)
4624	Design Studies 1B	(4)	5624	Design Studies 2B	(4)	6624	Design Studies 3B	(4)
4625	Design Studies 1C	(5)	5625	Design Studies 2C	(5)	6625	Design Studies 3C	(5)
4626	Design Studies 1D	(6)	5626	Design Studies 2D	(6)	6626	Design Studies 3D	(6)
4627	Design Studies 1G	(3)	5627	Design Studies 2G	(3)	6627	Design Studies 3G	(5)
4628	Design Studies 1H	(5)	5628	Design Studies 2H	(5)	6628	Design Studies 3H	(5)
4629	Design Studies 1J	(1)	5629	Design Studies 2J	(1)	6629	Design Studies 3J	(1)
4630	Design Studies 1K	(2)	5630	Design Studies 2K	(2)	6630	Design Studies 3K	(2)

ELECTRO-TECHNOLOGIES

4661	Electro-Technologies 1E	(1)	5661	Electro-Technologies 2E	(1)	6661	Electro-Technologies 3E	(1)
4662	Electro-Technologies 1F	(2)	5662	Electro-Technologies 2F	(2)	6662	Electro-Technologies 3F	(2)
4663	Electro-Technologies 1A	(3)	5663	Electro-Technologies 2A	(3)	6663	Electro-Technologies 3A	(3)
4664	Electro-Technologies 1B	(4)	5664	Electro-Technologies 2B	(4)	6664	Electro-Technologies 3B	(4)
4665	Electro-Technologies 1C	(5)	5665	Electro-Technologies 2C	(5)	6665	Electro-Technologies 3C	(5)
4666	Electro-Technologies 1D	(6)	5666	Electro-Technologies 2D	(6)	6666	Electro-Technologies 3D	(6)
4667	Electro-Technologies 1G	(3)	5667	Electro-Technologies 2G	(3)	6667	Electro-Technologies 3G	(5)
4668	Electro-Technologies 1H	(5)	5668	Electro-Technologies 2H	(5)	6668	Electro-Technologies 3H	(5)
4669	Electro-Technologies 1J	(1)	5669	Electro-Technologies 2J	(1)	6669	Electro-Technologies 3J	(1)
4670	Electro-Technologies 1K	(2)	5670	Electro-Technologies 2K	(2)	6670	Electro-Technologies 3K	(2)

ENERGY AND MINES

4711	Energy and Mines 1E	(1)	5711	Energy and Mines 2E	(1)	6711	Energy and Mines 3E	(1)
4712	Energy and Mines 1F	(2)	5712	Energy and Mines 2F	(2)	6712	Energy and Mines 3F	(2)
4713	Energy and Mines 1A	(3)	5713	Energy and Mines 2A	(3)	6713	Energy and Mines 3A	(3)
4714	Energy and Mines 1B	(4)	5714	Energy and Mines 2B	(4)	6714	Energy and Mines 3B	(4)
4715	Energy and Mines 1C	(5)	5715	Energy and Mines 2C	(5)	6715	Energy and Mines 3C	(5)
4716	Energy and Mines 1D	(6)	5716	Energy and Mines 2D	(6)	6716	Energy and Mines 3D	(6)
4717	Energy and Mines 1G	(3)	5717	Energy and Mines 2G	(3)	6717	Energy and Mines 3G	(5)
4718	Energy and Mines 1H	(5)	5718	Energy and Mines 2H	(5)	6718	Energy and Mines 3H	(5)
4719	Energy and Mines 1J	(1)	5719	Energy and Mines 2J	(1)	6719	Energy and Mines 3J	(1)
4720	Energy and Mines 1K	(2)	5720	Energy and Mines 2K	(2)	6720	Energy and Mines 3K	(2)

ENTERPRISE AND INNOVATION

4631	Enterprise and Innovation 1E	(1)	5631	Enterprise and Innovation 2E	(1)	6631	Enterprise and Innovation 3E	(1)
4632	Enterprise and Innovation 1F	(2)	5632	Enterprise and Innovation 2F	(2)	6632	Enterprise and Innovation 3F	(2)
4633	Enterprise and Innovation 1A	(3)	5633	Enterprise and Innovation 2A	(3)	6633	Enterprise and Innovation 3A	(3)
4634	Enterprise and Innovation 1B	(4)	5634	Enterprise and Innovation 2B	(4)	6634	Enterprise and Innovation 3B	(4)
4635	Enterprise and Innovation 1C	(5)	5635	Enterprise and Innovation 2C	(5)	6635	Enterprise and Innovation 3C	(5)
4636	Enterprise and Innovation 1D	(6)	5636	Enterprise and Innovation 2D	(6)	6636	Enterprise and Innovation 3D	(6)
4639	Enterprise and Innovation 1J	(1)	5639	Enterprise and Innovation 2J	(1)	6639	Enterprise and Innovation 3J	(1)
4640	Enterprise and Innovation 1K	(2)	5640	Enterprise and Innovation 2K	(2)	6640	Enterprise and Innovation 3K	(2)

FABRICATION STUDIES

4671	Fabrication Studies 1E	(1)	5671	Fabrication Studies 2E	(1)	6671	Fabrication Studies 3E	(1)
4672	Fabrication Studies 1F	(2)	5672	Fabrication Studies 2F	(2)	6672	Fabrication Studies 3F	(2)
4673	Fabrication Studies 1A	(3)	5673	Fabrication Studies 2A	(3)	6673	Fabrication Studies 3A	(3)
4674	Fabrication Studies 1B	(4)	5674	Fabrication Studies 2B	(4)	6674	Fabrication Studies 3B	(4)
4675	Fabrication Studies 1C	(5)	5675	Fabrication Studies 2C	(5)	6675	Fabrication Studies 3C	(5)
4676	Fabrication Studies 1D	(6)	5676	Fabrication Studies 2D	(6)	6676	Fabrication Studies 3D	(6)
4677	Fabrication Studies 1G	(3)	5677	Fabrication Studies 2G	(3)	6677	Fabrication Studies 3G	(5)
4678	Fabrication Studies 1H	(5)	5678	Fabrication Studies 2H	(5)	6678	Fabrication Studies 3H	(5)
4679	Fabrication Studies 1J	(1)	5679	Fabrication Studies 2J	(1)	6679	Fabrication Studies 3J	(1)
4680	Fabrication Studies 1K	(2)	5680	Fabrication Studies 2K	(2)	6680	Fabrication Studies 3K	(2)

FASHION STUDIES

4641	Fashion Studies 1E	(1)	5641	Fashion Studies 2E	(1)	6641	Fashion Studies 3E	(1)
4642	Fashion Studies 1F	(2)	5642	Fashion Studies 2F	(2)	6642	Fashion Studies 3F	(2)
4643	Fashion Studies 1A	(3)	5643	Fashion Studies 2A	(3)	6643	Fashion Studies 3A	(3)
4644	Fashion Studies 1B	(4)	5644	Fashion Studies 2B	(4)	6644	Fashion Studies 3B	(4)
4645	Fashion Studies 1C	(5)	5645	Fashion Studies 2C	(5)	6645	Fashion Studies 3C	(5)
4646	Fashion Studies 1D	(6)	5646	Fashion Studies 2D	(6)	6646	Fashion Studies 3D	(6)
4647	Fashion Studies 1G	(3)	5647	Fashion Studies 2G	(3)	6647	Fashion Studies 3G	(5)
4648	Fashion Studies 1H	(5)	5648	Fashion Studies 2H	(5)	6648	Fashion Studies 3H	(5)
4649	Fashion Studies 1J	(1)	5649	Fashion Studies 2J	(1)	6649	Fashion Studies 3J	(1)
4650	Fashion Studies 1K	(2)	5650	Fashion Studies 2K	(2)	6650	Fashion Studies 3K	(2)

FINANCIAL MANAGEMENT

4601	Financial Management 1E	(1)	5601	Financial Management 2E	(1)	6601	Financial Management 3E	(1)
4602	Financial Management 1F	(2)	5602	Financial Management 2F	(2)	6602	Financial Management 3F	(2)
4603	Financial Management 1A	(3)	5603	Financial Management 2A	(3)	6603	Financial Management 3A	(3)
4604	Financial Management 1B	(4)	5604	Financial Management 2B	(4)	6604	Financial Management 3B	(4)
4605	Financial Management 1C	(5)	5605	Financial Management 2C	(5)	6605	Financial Management 3C	(5)
4606	Financial Management 1D	(6)	5606	Financial Management 2D	(6)	6606	Financial Management 3D	(6)
4609	Financial Management 1J	(1)	5609	Financial Management 2J	(1)	6609	Financial Management 3J	(1)
4610	Financial Management 1K	(2)	5610	Financial Management 2K	(2)	6610	Financial Management 3K	(2)

FOODS

4531	Foods 1E	(1)	5531	Foods 2E	(1)	6531	Foods 3E	(1)
4532	Foods 1F	(2)	5532	Foods 2F	(2)	6532	Foods 3F	(2)
4533	Foods 1A	(3)	5533	Foods 2A	(3)	6533	Foods 3A	(3)
4534	Foods 1B	(4)	5534	Foods 2B	(4)	6534	Foods 3B	(4)
4535	Foods 1C	(5)	5535	Foods 2C	(5)	6535	Foods 3C	(5)
4536	Foods 1D	(6)	5536	Foods 2D	(6)	6536	Foods 3D	(6)
4537	Foods 1G	(3)	5537	Foods 2G	(3)	6537	Foods 3G	(5)
4538	Foods 1H	(5)	5538	Foods 2H	(5)	6538	Foods 3H	(5)
4539	Foods 1J	(1)	5539	Foods 2J	(1)	6539	Foods 3J	(1)
4540	Foods 1K	(2)	5540	Foods 2K	(2)	6540	Foods 3K	(2)

FORESTRY

4721	Forestry 1E	(1)	5721	Forestry 2E	(1)	6711	Forestry 3E	(1)
4722	Forestry 1F	(2)	5722	Forestry 2F	(2)	6722	Forestry 3F	(2)
4723	Forestry 1A	(3)	5723	Forestry 2A	(3)	6723	Forestry 3A	(3)
4724	Forestry 1B	(4)	5724	Forestry 2B	(4)	6724	Forestry 3B	(4)
4725	Forestry 1C	(5)	5725	Forestry 2C	(5)	6725	Forestry 3C	(5)
4726	Forestry 1D	(6)	5726	Forestry 2D	(6)	6726	Forestry 3D	(6)
4729	Forestry 1J	(1)	5729	Forestry 2J	(1)	6729	Forestry 3J	(1)
4730	Forestry 1K	(2)	5730	Forestry 2K	(2)	6730	Forestry 3K	(2)

INFORMATION PROCESSING

4611	Information Processing 1E	(1)	5611	Information Processing 2E	(1)	6611	Information Processing 3E	(1)
4612	Information Processing 1F	(2)	5612	Information Processing 2F	(2)	6612	Information Processing 3F	(2)
4613	Information Processing 1A	(3)	5613	Information Processing 2A	(3)	6613	Information Processing 3A	(3)
4614	Information Processing 1B	(4)	5614	Information Processing 2B	(4)	6614	Information Processing 3B	(4)
4615	Information Processing 1C	(5)	5615	Information Processing 2C	(5)	6615	Information Processing 3C	(5)
4616	Information Processing 1D	(6)	5616	Information Processing 2D	(6)	6616	Information Processing 3D	(6)
4617	Information Processing 1G	(3)	5617	Information Processing 2G	(3)	6617	Information Processing 3G	(5)
4618	Information Processing 1H	(5)	5618	Information Processing 2H	(5)	6618	Information Processing 3H	(5)
4619	Information Processing 1J	(1)	5619	Information Processing 2J	(1)	6619	Information Processing 3J	(1)
4620	Information Processing 1K	(2)	5620	Information Processing 2K	(2)	6620	Information Processing 3K	(2)

LEGAL STUDIES

4551	Legal Studies 1E	(1)	5551	Legal Studies 2E	(1)	6551	Legal Studies 3E	(1)
4552	Legal Studies 1F	(2)	5552	Legal Studies 2F	(2)	6552	Legal Studies 3F	(2)
4553	Legal Studies 1A	(3)	5553	Legal Studies 2A	(3)	6553	Legal Studies 3A	(3)
4554	Legal Studies 1B	(4)	5554	Legal Studies 2B	(4)	6554	Legal Studies 3B	(4)
4555	Legal Studies 1C	(5)	5555	Legal Studies 2C	(5)	6555	Legal Studies 3C	(5)
4556	Legal Studies 1D	(6)	5556	Legal Studies 2D	(6)	6556	Legal Studies 3D	(6)
4559	Legal Studies 1J	(1)	5559	Legal Studies 2J	(1)	6559	Legal Studies 3J	(1)
4560	Legal Studies 1K	(2)	5560	Legal Studies 2K	(2)	6560	Legal Studies 3K	(2)

LOGISTICS

4753 Logistics 1E .... (1)
4754 Logistics 1F .... (2)
4755 Logistics 1A .... (3)
4756 Logistics 1B .... (4)
4757 Logistics 1C .... (5)
4758 Logistics 1D .... (6)

5753 Logistics 2E .... (1)
5754 Logistics 2F .... (2)
5755 Logistics 2A .... (3)
5756 Logistics 2B .... (4)
5757 Logistics 2C .... (5)
5758 Logistics 2D .... (6)

6753 Logistics 3E .... (1)
6754 Logistics 3F .... (2)
6755 Logistics 3A .... (3)
6756 Logistics 3B .... (4)
6757 Logistics 3C .... (5)
6758 Logistics 3D .... (6)

MANAGEMENT AND MARKETING

4591 Management and Marketing 1E .... (1)
4592 Management and Marketing 1F .... (2)
4593 Management and Marketing 1A .... (3)
4594 Management and Marketing 1B .... (4)
4595 Management and Marketing 1C .... (5)
4596 Management and Marketing 1D .... (6)
4597 Management and Marketing 1G .... (3)
4598 Management and Marketing 1H .... (5)
4599 Management and Marketing 1J .... (1)
4600 Management and Marketing 1K .... (2)

5591 Management and Marketing 2E .... (1)
5592 Management and Marketing 2F .... (2)
5593 Management and Marketing 2A .... (3)
5594 Management and Marketing 2B .... (4)
5595 Management and Marketing 2C .... (5)
5596 Management and Marketing 2D .... (6)
5597 Management and Marketing 2G .... (3)
5598 Management and Marketing 2H .... (5)
5599 Management and Marketing 2J .... (1)
5600 Management and Marketing 2K .... (2)

6591 Management and Marketing 3E .... (1)
6592 Management and Marketing 3F .... (2)
6593 Management and Marketing 3A .... (3)
6594 Management and Marketing 3B .... (4)
6595 Management and Marketing 3C .... (5)
6596 Management and Marketing 3D .... (6)
6597 Management and Marketing 3G .... (5)
6598 Management and Marketing 3H .... (5)
6599 Management and Marketing 3J .... (1)
6600 Management and Marketing 3K .... (2)

MECHANICS

4681 Mechanics 1E .... (1)
4682 Mechanics 1F .... (2)
4683 Mechanics 1A .... (3)
4684 Mechanics 1B .... (4)
4685 Mechanics 1C .... (5)
4686 Mechanics 1D .... (6)
4687 Mechanics 1G .... (3)
4688 Mechanics 1H .... (5)
4689 Mechanics 1J .... (1)
4690 Mechanics 1K .... (2)

5681 Mechanics 2E .... (1)
5682 Mechanics 2F .... (2)
5683 Mechanics 2A .... (3)
5684 Mechanics 2B .... (4)
5685 Mechanics 2C .... (5)
5686 Mechanics 2D .... (6)
5687 Mechanics 2G .... (3)
5688 Mechanics 2H .... (5)
5689 Mechanics 2J .... (1)
5690 Mechanics 2K .... (2)

6681 Mechanics 3E .... (1)
6682 Mechanics 3F .... (2)
6683 Mechanics 3A .... (3)
6684 Mechanics 3B .... (4)
6685 Mechanics 3C .... (5)
6686 Mechanics 3D .... (6)
6687 Mechanics 3G .... (5)
6688 Mechanics 3H .... (5)
6689 Mechanics 3J .... (1)
6690 Mechanics 3K .... (2)

TOURISM STUDIES

4561 Tourism Studies 1E .... (1)
4562 Tourism Studies 1F .... (2)
4563 Tourism Studies 1A .... (3)
4564 Tourism Studies 1B .... (4)
4565 Tourism Studies 1C .... (5)
4566 Tourism Studies 1D .... (6)
4567 Tourism Studies 1G .... (3)
4568 Tourism Studies 1H .... (5)
4569 Tourism Studies 1J .... (1)
4570 Tourism Studies 1K .... (2)

5561 Tourism Studies 2E .... (1)
5562 Tourism Studies 2F .... (2)
5563 Tourism Studies 2A .... (3)
5564 Tourism Studies 2B .... (4)
5565 Tourism Studies 2C .... (5)
5566 Tourism Studies 2D .... (6)
5567 Tourism Studies 2G .... (3)
5568 Tourism Studies 2H .... (5)
5569 Tourism Studies 2J .... (1)
5570 Tourism Studies 2K .... (2)

6561 Tourism Studies 3E .... (1)
6562 Tourism Studies 3F .... (2)
6563 Tourism Studies 3A .... (3)
6564 Tourism Studies 3B .... (4)
6565 Tourism Studies 3C .... (5)
6566 Tourism Studies 3D .... (6)
6567 Tourism Studies 3G .... (5)
6568 Tourism Studies 3H .... (5)
6569 Tourism Studies 3J .... (1)
6570 Tourism Studies 3K .... (2)

WILDLIFE

4731 Wildlife 1E .... (1)
4732 Wildlife 1F .... (2)
4733 Wildlife 1A .... (3)
4734 Wildlife 1B .... (4)
4735 Wildlife 1C .... (5)
4736 Wildlife 1D .... (6)
4743 Wildlife 1J .... (1)
4744 Wildlife 1K .... (2)

5731 Wildlife 2E .... (1)
5732 Wildlife 2F .... (2)
5733 Wildlife 2A .... (3)
5734 Wildlife 2B .... (4)
5735 Wildlife 2C .... (5)
5736 Wildlife 2D .... (6)
5743 Wildlife 2J .... (1)
5744 Wildlife 2K .... (2)

6731 Wildlife 3E .... (1)
6732 Wildlife 3F .... (2)
6733 Wildlife 3A .... (3)
6734 Wildlife 3B .... (4)
6735 Wildlife 3C .... (5)
6736 Wildlife 3D .... (6)
6743 Wildlife 3J .... (1)
6744 Wildlife 3K .... (2)

III. DIRECTIONS FOR TRACKING AND REPORTING STUDENT ACHIEVEMENT IN CAREER AND TECHNOLOGY STUDIES TO ALBERTA EDUCATION:

TO BE USED WHEN REPORTING "**INDIVIDUAL**" MODULES

Alberta Education has modified its computer applications and is prepared to accept reports of student achievement at the module level. Changes in the electronic file specifications were communicated to school authorities and vendors of student records software in January, 1997. However, an additional year has been granted to make changes to automated student records systems. For the 1997 - 98 school term, schools and school systems have a choice in reporting student achievement. You may either report student achievement by:

- "**Bundling**" Modules (as described in section II: Directions for Tracking and Reporting Student Achievement in CTS to Alberta Education when "Bundling" Modules), **OR**
- Reporting "**Individual**" Modules (as described below)

A. SCHOOLS DESIGN COURSES

1. The CTS curriculum structure allows teachers and schools in design courses by combining 1-credit modules:
   - within and across strands, and
   - within and across levels (introductory, intermediate and advanced).
2. Schools will design courses composed of modules. Guidelines for module sequence, facility and equipment, and instructional qualifications are provided in the *Guide to Standards and Implementation* for each strand.

B. STUDENT ACHIEVEMENT REPORTED TO ALBERTA EDUCATION BY "INDIVIDUAL" MODULES

1. Schools may report individual CTS modules to Alberta Education commencing with the January 1998 reporting period. Schools will be able to do their reporting either electronically or manually, using the new file format. Details of the new data collection files and values for these fields were communicated in a document, "Electronic Data Exchange User Guide" sent to each school reporting high school achievement in June, 1997. This document and the "Electronic Data File Specifications" are available on the Internet at **http://ednet.edc.gov.ab.ca/technology**
2. Schools reporting individual CTS modules must use the new seven digit, alpha-numeric course codes.
3. To successfully complete a module, a student must demonstrate all of the module learner expectations to the established standard as outlined in the strand *Guide to Standard and Implementation.*
4. A mark of 50% or higher will be given for each module successfully completed. Schools will report to the Educational Information Exchange all modules, successful y completed, as well as incompleted modules. However, only successfully completed modules will be included on the student transcript and detailed profile.

CAREER AND TECHNOLOGY STUDIES
MODULE CODES AND NAMES
TO BE USED WHEN REPORTING BY "INDIVIDUAL" MODULES

MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
	AGRICULTURE	
AGR1010	Agriculture: The Big Picture	Agr: The Big Picture
AGR1030	Production Basics	Production Basics
AGR1060	Consumer Products & Services	Consumer Prod & Services
AGR1070	Basic Landscape/Turf Care	Basic Landscape/Turf Care
AGR1080	Basic Floral Design	Basic Floral Design
AGR1090	Market Fundamentals	Market Fundamentals
AGR1100	Agriculture Technology	Agriculture Technology
AGR1110	Resource Management	Resource Management
AGR2020	Animal Husbandry/Welfare	Animal Husbandry/Welfare
AGR2030	Field Crops 1 (Materials & Processes)	Field Crops 1
AGR2040	Livestock/Poultry 1 (Materials & Processes)	Livestock/Poultry 1
AGR2050	Agrifoods 1 (Materials & Processes)	Agrifoods 1
AGR2060	Landscape/Turf Management 1 (Maintenance Practices)	Landscape/Turf Mgmt 1
AGR2070	Equine 1 (Materials & Processes)	Equine 1
AGR2080	Floral Design 1 (Projects for All Occasions)	Floral Design 1
AGR2090	Marketing 1 (Open Marketing Structures)	Marketing 1
AGR2100	Protected Structures	Protected Structures
AGR2120	Soils Management 1 (Soil Properties/Classification)	Soils Management 1
AGR2130	Integrated Pest Management	Integrated Pest Mgmt
AGR2140	Nursery/Greenhouse Crops 1 (Materials & Processes)	Nursery/Grnhouse Crops 1
AGR3010	Issues in Agriculture	Issues in Agriculture
AGR3030	Field Crops 2 (Management Techniques)	Field Crops 2
AGR3040	Livestock/Poultry 2 (Management Techniques)	Livestock/Poultry 2
AGR3050	Agrifoods 2 (Standards & Regulation)	Agrifoods 2
AGR3060	Landscape/Turf Management 2 (Installation & Repair)	Landscape/Turf Mgmt 2
AGR3070	Equine 2 (Management Techniques)	Equine 2
AGR3080	Floral Design 2 (Creative Design & Display)	Floral Design 2
AGR3090	Marketing 2 (Closed Marketing Structures)	Marketing 2
AGR3100	Biotechnology	Biotechnology
AGR3110	Water Management	Water Management
AGR3120	Soils Management 2 (Soil Testing & Amending)	Soils Management 2
AGR3130	Sustainable Agriculture Systems	Sustainable Agr Systems
AGR3140	Nursery/Greenhouse Crops 2 (Management Techniques)	Nursery/Grnhouse Crops 2
	COMMUNITY HEALTH	
CMH1010	Family Dynamics	Family Dynamics
CMH1040	Caring for Children	Caring for Children
CMH1050	Child Development	Child Development
CMH1060	Home Care 1	Home Care 1

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
CMH1080	Perspectives on Health	Perspectives on Health
CMH2010	Adolescent Health Issues	Adolescent Health Issues
CMH2020	Perspectives on Marriage	Perspectives on Marriage
CMH2030	Community Volunteerism	Community Volunteerism
CMH2050	Day Care 1	Day Care 1
CMH2060	Home Care 2 (Personal Care Services)	Home Care 2
CMH2070	Sensory Challenges	Sensory Challenges
CMH2080	Respiratory System	Respiratory System
CMH2090	Circulatory System	Circulatory System
CMH2100	Musculoskeletal System	Musculoskeletal System
CMH2110	Complementary Therapies	Complementary Therapies
CMH2120	First Aid/CPR	First Aid/CPR
CMH2130	Sports First Aid 1	Sports First Aid 1
CMH3010	Family Issues	Family Issues
CMH3020	Parenting	Parenting
CMH3030	Aging	Aging
CMH3040	Prenatal & Postnatal Care	Prenatal & Postnatal Care
CMH3050	Day Care 2	Day Care 2
CMH3060	Home Care 3 (Special Conditions)	Home Care 3
CMH3070	Challenged Individuals	Challenged Individuals
CMH3080	Digestive System	Digestive System
CMH3090	Nervous/Endocrine Systems	Nervous/Endocrine Systems
CMH3100	Mental Health	Mental Health
CMH3110	Advances in Medical Technology	Advances in Medical Tech
CMH3120	First Aid/CPR for Children	FirstAid/CPR for Children
CMH3130	Sports First Aid 2	Sports First Aid 2
CTR1210	Personal Safety (Management)	Personal Safety
COMMUNICATION TECHNOLOGY		
COM1010	Presentation & Communication 1	Present & Communicate 1
COM1020	Media & You	Media & You
COM1030	Photography 1	Photography 1
COM1050	Printing 1	Printing 1
COM1060	Audio/Video Production 1	Audio/Video Production 1
COM1070	Animation 1	Animation 1
COM1080	Digital Design 1	Digital Design 1
COM2010	Presentation & Communication 2	Present & Communicate 2
COM2020	Media Design & Analysis 1	Media Design & Analysis 1
COM2030	Script Writing 1	Script Writing 1
COM2040	Photography 2	Photography 2
COM2050	Photographic Communication	Photo Communication
COM2060	Photographic Techniques 1	Photographic Techniques 1
COM2070	Printing Techniques 1	Printing Techniques 1
COM2080	Printing Applications 1	Printing Applications 1
COM2090	Audio/Video 1	Audio/Video 1
COM2100	Audio/Video 2	Audio/Video 2
COM2110	Animation 2	Animation 2

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
COM2120	Digital Design 2	Digital Design 2
COM2130	Special Effects Photography	Special Effects Photo
COM3010	Presentation & Communication 3	Present & Communicate 3
COM3020	Media Design & Analysis 2	Media Design & Analysis 2
COM3030	Script Writing 2	Script Writing 2
COM3040	Photography 3	Photography 3
COM3050	Photojournalism	Photojournalism
COM3060	Photographic Techniques 2	Photographic Techniques 2
COM3070	Colour Photography	Colour Photography
COM3080	Printing Techniques 2	Printing Techniques 2
COM3090	Printing Applications 2	Printing Applications 2
COM3100	Audio 3	Audio 3
COM3110	Video 3	Video 3
COM3120	Animation 3	Animation 3
COM3130	Digital Design 3	Digital Design 3
CONSTRUCTION TECHNOLOGIES		
CON1010	Basic Tools & Materials	Basic Tools & Materials
CON1070	Building Construction	Building Construction
CON1120	Project Management	Project Management
CON1130	Solid Stock Construction	Solid Stock Construction
CON1140	Turning Operations	Turning Operations
CON1160	Manufactured Materials	Manufactured Materials
CON1180	Mold Making & Casting	Mold Making & Casting
CON2010	Site Preparation	Site Preparation
CON2020	Concrete Forming	Concrete Forming
CON2030	Alternative Foundations	Alternative Foundations
CON2040	Framing Systems 1 (Floor & Wall)	Framing Systems 1
CON2050	Roof Structures 1 (Framing & Finishing)	Roof Structures 1
CON2060	Exterior Finishing (Door, Window & Siding)	Exterior Finishing
CON2070	Electrical Systems	Electrical Systems
CON2080	Plumbing Systems	Plumbing Systems
CON2090	Climate Control Systems	Climate Control Systems
CON2100	Agri-structures	Agri-structures
CON2120	Multiple Materials	Multiple Materials
CON2130	Furniture Making 1 (Box Construction)	Furniture Making 1
CON2140	Furniture Making 2 (Frame & Panel)	Furniture Making 2
CON2150	Finishing & Refinishing	Finishing & Refinishing
CON2160	Cabinetmaking 1 (Web & Face Frame)	Cabinetmaking 1
CON2170	Cabinetmaking 2 (Door & Drawer)	Cabinetmaking 2
CON2180	Wood Forming	Wood Forming
CON2190	Manufacturing Systems	Manufacturing Systems
CON2200	Product Development	Product Development
CON3010	Concrete Work (Structures & Finishes)	Concrete Work
CON3020	Masonry Work (Structures & Finishes)	Masonry Work
CON3030	Wall & Ceiling Finishing	Wall & Ceiling Finishing
CON3040	Stair Construction	Stair Construction

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
CON3050	Roof Structures 2 (Framing & Covering)	Roof Structures 2
CON3060	Doors & Trim	Doors & Trim
CON3070	Floorcovering	Floorcovering
CON3080	Energy-efficient Housing	Energy-efficient Housing
CON3090	Renovations/Restorations	Renovations/Restorations
CON3100	Commercial Structures	Commercial Structures
CON3110	Site Management	Site Management
CON3120	Tool Maintenance	Tool Maintenance
CON3130	Furniture Making 3 (Leg & Rail)	Furniture Making 3
CON3140	Furniture Making 4 (Surface Enhancement)	Furniture Making 4
CON3150	Furniture Repair	Furniture Repair
CON3160	Cabinetmaking 3 (Cabinets/Countertops)	Cabinetmaking 3
CON3170	Cabinetmaking 4 (Layout & Installation)	Cabinetmaking 4
CON3190	Production Planning	Production Planning
CON3200	Production Management	Production Management
CON3210	Framing Systems 2 (Floor, Wall & Ceiling)	Framing Systems 2
COSMETOLOGY STUDIES		
COS1010	Personal Images	Personal Images
COS1020	Hair Graphics 1	Hair Graphics 1
COS1030	Hair & Scalp Care 1	Hair & Scalp Care 1
COS1040	Forming & Finishing 1	Forming & Finishing 1
COS1050	Permanent Waving 1 (The Physical Process)	Permanent Waving 1
COS1060	Skin Care 1 (Basic Practices)	Skin Care 1
COS1070	Manicuring 1	Manicuring 1
COS1080	Theatrical Makeup 1 (Basic Principles)	Theatrical Makeup 1
COS2010	Hair Graphics 2	Hair Graphics 2
COS2020	Hair & Scalp Care 2	Hair & Scalp Care 2
COS2030	Forming & Finishing 2	Forming & Finishing 2
COS2040	Haircutting 1	Haircutting 1
COS2050	Hair Care & Cutting 1 (Client Services)	Hair Care & Cutting 1
COS2060	Permanent Waving 2 (Cold Waving)	Permanent Waving 2
COS2070	Permanent Waving 3 (Heat-assisted)	Permanent Waving 3
COS2080	Permanent Waving 4 (Client Services)	Permanent Waving 4
COS2090	Colouring 1	Colouring 1
COS2100	Colour Removal 1	Colour Removal 1
COS2110	Colouring & Removal 1 (Client Services)	Colouring & Removal 1
COS2120	Facials & Makeup 1	Facials & Makeup 1
COS2130	Facials & Makeup 2 (Client Services)	Facials & Makeup 2
COS2140	Skin Care 2 (Client Services)	Skin Care 2
COS2150	Manicuring 2	Manicuring 2
COS2160	Nail Art	Nail Art
COS2170	Manicuring 3 (Client Services)	Manicuring 3
COS2180	Hairpieces & Extensions	Hairpieces & Extensions
COS2190	Theatrical Makeup 2 (Planning the Images)	Theatrical Makeup 2
COS2200	Historical Cosmetology	Historical Cosmetology
COS2210	Sales & Service 1 (Principles & Practices)	Sales and Service Principles and Practices

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
COS3010	Professional Practices	Professional Practices
COS3020	Long Hair Graphics	Long Hair Graphics
COS3030	Hair & Scalp Care 3	Hair & Scalp Care 3
COS3040	Hair & Scalp Care 4 (Client Services)	Hair & Scalp Care 4
COS3050	Haircutting 2	Haircutting 2
COS3060	Haircutting 3 (Client Services)	Haircutting 3
COS3070	Hair Care & Cutting 2 (Client Services)	Hair Care & Cutting 2
COS3080	Permanent Waving 5 (Designer)	Permanent Waving 5
COS3090	Relax/Straighten Hair	Relax/Straighten Hair
COS3100	Wave, Relax & Straighten Hair (Client Services)	WaveRelax&Straighten Hair
COS3110	Colouring 2 (Permanent)	Colouring 2
COS3120	Colour Removal 2	Colour Removal 2
COS3130	Colouring & Removal 2 (Client Services)	Colouring & Removal 2
COS3140	Body Therapy	Body Therapy
COS3150	Hair Removal	Hair Removal
COS3160	Skin Care 3 (Client Services)	Skin Care 3
COS3170	Male Facial Grooming 1	Male Facial Grooming 1
COS3180	Male Facial Grooming 2 (Client Services)	Male Facial Grooming 2
COS3190	Nail Technology	Nail Technology
COS3200	Pedicuring	Pedicuring
COS3210	Nail Care (Client Services)	Nail Care
COS3220	Wigs & Toupees	Wigs & Toupees
COS3230	Hair Goods (Client Services)	Hair Goods
COS3240	Theatrical Makeup 3 (Changing Images)	Theatrical Makeup 3
COS3250	Theatrical Makeup 4 (Client Services)	Theatrical Makeup 4
COS3260	Facial & Body Adornment	Facial & Body Adornment
COS3270	Creative Cosmetology	Creative Cosmetology
COS3280	Sales & Service 2 (Effectiveness)	Sales & Service 2
COS3290	Competition Cosmetology	Competition Cosmetology
CAREER TRANSITIONS		
CTR1010	Job Preparation	Job Preparation
CTR1020	Leading by Example	Leading by Example
CTR1110	Project 1A	Project 1A
CTR1120	Project 1B	Project 1B
CTR1210	Personal Safety (Management)	Personal Safety
CTR2010	Job Maintenance	Job Maintenance
CTR2020	Taking the Lead	Taking the Lead
CTR2030	Governance & Leadership	Governance & Leadership
CTR2110	Project 2A	Project 2A
CTR2120	Project 2B	Project 2B
CTR2130	Project 2C	Project 2C
CTR2140	Project 2D	Project 2D
CTR2150	Project 2E	Project 2E
CTR2210	Workplace Safety (Practices)	Workplace Safety
CTR3010	Preparing for Change	Preparing for Change
CTR3020	Organizational Leadership	Organizational Leadership

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
CTR3030	Leading for Change	Leading for Change
CTR3040	Practicum A	Practicum A
CTR3050	Practicum B	Practicum B
CTR3060	Practicum C	Practicum C
CTR3070	Practicum D	Practicum D
CTR3080	Practicum E	Practicum E
CTR3110	Project 3A	Project 3A
CTR3120	Project 3B	Project 3B
CTR3130	Project 3C	Project 3C
CTR3140	Project 3D	Project 3D
CTR3150	Project 3E	Project 3E
CTR3210	Safety Management Systems	Safety Management Systems
DESIGN STUDIES		
DES1010	Sketch, Draw & Model	Sketch, Draw & Model
DES1020	The Design Process	The Design Process
DES1030	2-D Design Fundamentals	2-D Design Fundamentals
DES1040	3-D Design Fundamentals	3-D Design Fundamentals
DES1050	CAD Fundamentals (Computer-aided Design)	CAD Fundamentals
DES1060	Drafting/Design Fundamentals	Draft/Design Fundamentals
DES2010	2-D Design Applications	2-D Design Applications
DES2020	3-D Design Applications	3-D Design Applications
DES2030	CAD Applications (Computer-aided Design)	CAD Applications
DES2040	Drafting/Design Applications	Draft/Design Applications
DES2050	Technical Drawing Applications	Tech Drawing Applications
DES2060	The Evolution of Design	The Evolution of Design
DES3010	2-D Design Studio 1	2-D Design Studio 1
DES3020	2-D Design Studio 2	2-D Design Studio 2
DES3030	2-D Design Studio 3	2-D Design Studio 3
DES3040	3-D Design Studio 1	3-D Design Studio 1
DES3050	3-D Design Studio 2	3-D Design Studio 2
DES3060	3-D Design Studio 3	3-D Design Studio 3
DES3070	Living Environment Studio 1	Living Environ Studio 1
DES3080	Living Environment Studio 2	Living Environ Studio 2
DES3090	Living Environment Studio 3	Living Environ Studio 3
DES3100	CAD Modelling Studio	CAD Modelling Studio
DES3110	Drafting/Design Studio 1	Drafting/Design Studio 1
DES3120	Drafting/Design Studio 2	Drafting/Design Studio 2
DES3130	Drafting/Design Studio 3	Drafting/Design Studio 3
DES3140	Technical Drawing Studio 1	Technical Draw Studio 1
DES3150	Technical Drawing Studio 2	Technical Draw Studio 2
DES3160	Technical Drawing Studio 3	Technical Draw Studio 3
DES3170	Visualizing the Future	Visualizing the Future
DES3180	The Design Profession	The Design Profession
DES3190	Portfolio Presentation	Portfolio Presentation
ELECTRO-TECHNOLOGIES		
ELT1010	Electro-assembly 1	Electro-assembly 1

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
ELT1030	Conversion & Distribution	Conversion & Distribution
ELT1050	Electronic Power Supply 1	Electronic Power Supply 1
ELT1060	Digital Technology 1	Digital Technology 1
ELT1080	Control Systems 1	Control Systems 1
ELT1090	Analog Communication 1	Analog Communication 1
ELT1100	Electronic Communication	Electronic Communication
ELT1110	Security Systems 1	Security Systems 1
ELT1130	Robotics 1	Robotics 1
ELT2010	Electro-assembly 2	Electro-assembly 2
ELT2020	Electrical Servicing	Electrical Servicing
ELT2030	Branch Circuit Wiring	Branch Circuit Wiring
ELT2050	Electronic Power Supply 2	Electronic Power Supply 2
ELT2060	Digital Technology 2	Digital Technology 2
ELT2070	Computer Technology	Computer Technology
ELT2080	Control Systems 2	Control Systems 2
ELT2090	Analog Communication 2	Analog Communication 2
ELT2100	Radio Communication	Radio Communication
ELT2110	Security Systems 2	Security Systems 2
ELT2120	Electro-optics	Electro-optics
ELT2130	Magnetic Control Devices	Magnetic Control Devices
ELT2140	Robotics 2	Robotics 2
ELT2150	Electronic Controls	Electronic Controls
ELT3010	Electro-assembly 3	Electro-assembly 3
ELT3020	Electronic Servicing	Electronic Servicing
ELT3030	Power Systems & Services	Power Systems & Services
ELT3040	Generation/Transformation	Generation/Transformation
ELT3060	Digital Technology 3	Digital Technology 3
ELT3070	Digital Applications	Digital Applications
ELT3080	Microprocessors	Microprocessors
ELT3090	Microprocessor Interface	Microprocessor Interface
ELT3100	Analog Communication 3	Analog Communication 3
ELT3110	Amplifiers	Amplifiers
ELT3130	Data/Telemetry Systems	Data/Telemetry Systems
ELT3140	Motors	Motors
ELT3150	Robotics 3	Robotics 3
ELT3160	Control Applications	Control Applications
	ENERGY AND MINES	
ENM1010	Overview of Alberta Geology	Overview Alberta Geology
ENM1020	Nonrenewable Resources	Nonrenewable Resources
ENM1050	Renewable Resources	Renewable Resources
ENM1060	Consumer Products & Services	Consumer Product/Services
ENM1090	Fundamentals of Recycling	Fundamentals of Recycling
ENM1100	Conservation Challenge	Conservation Challenge
ENM2010	Managing Alberta's Resources	Manage Alberta Resources
ENM2020	Conventional Oil/Gas 1 (Resource Exploration)	Conventional Oil/Gas 1
ENM2030	Oil Sands/Heavy Oil/Coal 1 (Resource Exploration)	Oil Sand/Heavy Oil/Coal 1

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
ENM2040	Metals/Nonmetals 1 (Resource Exploration)	Metals/Nonmetals 1
ENM2050	Renewable Energy Technology	Renew Energy Technology
ENM2060	Refining Hydrocarbons	Refining Hydrocarbons
ENM2070	Refining Rocks & Minerals	Refining Rocks & Minerals
ENM2080	Supply & Distribution	Supply & Distribution
ENM2090	Energy Designs/Systems 1 (Basic Principles)	Energy Designs/Systems 1
ENM2100	Environmental Safety	Environmental Safety
ENM3010	Energy & the Environment	Energy & the Environment
ENM3020	Conventional Oil/Gas 2 (Recovery & Production)	Conventional Oil/Gas 2
ENM3030	Oil Sands/Heavy Oil/Coal 2 (Recovery & Production)	Oil Sand/Heavy Oil/Coal 2
ENM3040	Metals/Nonmetals 2 (Recovery & Production)	Metals/Nonmetals 2
ENM3050	Sustainable Energy (The Power & Potential)	Sustainable Energy
ENM3060	Petrochemicals	Petrochemicals
ENM3070	Industrial Materials (Primary Manufacturing)	Industrial Materials
ENM3080	Market Basics & Trends	Market Basics & Trends
ENM3090	Energy Designs/Systems 2 (Practical Applications)	Energy Designs/Systems 2
ENM3100	Integrated Resource Management (Balancing Needs)	Integrated Resource Mgmt
	ENTERPRISE AND INNOVATION	
ENT1010	Challenge & Opportunity	Challenge & Opportunity
ENT1020	Planning a Venture	Planning a Venture
ENT2010	Analyzing Ventures	Analyzing Ventures
ENT2020	Financing Ventures	Financing Ventures
ENT2030	Marketing the Venture	Marketing the Venture
ENT2040	Implementing the Venture	Implementing the Venture
ENT3010	Managing the Venture	Managing the Venture
ENT3020	Expanding the Venture	Expanding the Venture
	FABRICATION STUDIES	
CON1010	Basic Tools & Materials	Basic Tools & Materials
FAB1040	Oxyacetylene Welding	Oxyacetylene Welding
FAB1050	Basic Electric Welding	Basic Electric Welding
FAB1090	Sheet Fabrication 1 (Hand Processes)	Sheet Fabrication 1
FAB1100	Fabrication Principles	Fabrication Principles
FAB1110	Bar & Tubular Fabrication	Bar & Tubular Fabrication
FAB1120	Foundry 1 (One-piece Pattern)	Foundry 1
FAB1130	Principles of Machining	Principles of Machining
FAB1160	Production Systems	Production Systems
FAB2010	Structural Engineering	Structural Engineering
FAB2020	Print Reading	Print Reading
FAB2030	Oxyfuel Welding	Oxyfuel Welding
FAB2040	Thermal Cutting	Thermal Cutting
FAB2050	Arc Welding 1	Arc Welding 1
FAB2060	Arc Welding 2	Arc Welding 2
FAB2070	Gas Metal Arc Welding 1	Gas Metal Arc Welding 1
FAB2090	Sheet Fabrication 2 (Machine Processes)	Sheet Fabrication 2
FAB2100	Sheet Fabrication 3 (Parallel Line)	Sheet Fabrication 3
FAB2110	Forging Fundamentals	Forging Fundamentals

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
FAB2120	Foundry 2 (Split Pattern)	Foundry 2
FAB2130	Precision Turning 1	Precision Turning 1
FAB2140	Precision Milling 1	Precision Milling 1
FAB2150	CNC Turning (Computer Numerical Control)	CNC Turning
FAB2160	Custom Fabrication	Custom Fabrication
FAB2170	Pipe Fitting	Pipe Fitting
FAB3010	Materials Testing	Materials Testing
FAB3020	Metallurgy Fundamentals	Metallurgy Fundamentals
FAB3030	Gas Tungsten Arc Welding	Gas Tungsten Arc Welding
FAB3040	Specialized Welding	Specialized Welding
FAB3050	Arc Welding 3	Arc Welding 3
FAB3060	Arc Welding 4	Arc Welding 4
FAB3070	Pipe & Tubular Welding	Pipe & Tubular Welding
FAB3080	Automated Welding	Automated Welding
FAB3090	Sheet Fabrication 4 (Radial Line)	Sheet Fabrication 4
FAB3110	Sheet Fabrication 5 (Duct Components)	Sheet Fabrication 5
FAB3120	Foundry 3 (Core Molding)	Foundry 3
FAB3130	Precision Turning 2	Precision Turning 2
FAB3140	Precision Milling 2	Precision Milling 2
FAB3150	CNC Milling (Computer Numerical Control)	CNC Milling
FAB3160	Prefabrication Principles	Prefabrication Principles
FAB3170	Gas Metal Arc Welding 2	Gas Metal Arc Welding 2
FASHION STUDIES		
FAS1030	Ready, Set, Sew!	Ready, Set, Sew
FAS1040	Fashion Basics	Fashion Basics
FAS1050	Repair & Recycle	Repair & Recycle
FAS1060	Creating Accessories 1	Creating Accessories 1
FAS1070	Creative Yarns/Textiles	Creative Yarns/Textiles
FAS2010	Fashion Dynamics	Fashion Dynamics
FAS2020	Fashion Illustration 1	Fashion Illustration 1
FAS2030	CAD Patterns 1 (Computer-aided Design)	CAD Patterns 1
FAS2040	Evolution of Fashion	Evolution of Fashion
FAS2050	Flat Pattern	Flat Pattern
FAS2060	Pattern Drafting 1	Pattern Drafting 1
FAS2070	Creative Construction	Creative Construction
FAS2080	Activewear	Activewear
FAS2090	Specialty Fabrics 1	Specialty Fabrics 1
FAS2100	Sewing for Others	Sewing for Others
FAS2110	Creating Home Decor	Creating Home Decor
FAS2120	Surface Embellishment	Surface Embellishment
FAS2140	Fashion Merchandising	Fashion Merchandising
FAS2150	Upholstery	Upholstery
FAS2160	Creating Accessories 2	Creating Accessories 2
FAS3010	Fashion Illustration 2	Fashion Illustration 2
FAS3020	CAD Patterns 2 (Computer-aided Design)	CAD Patterns 2
FAS3030	Pattern Drafting 2	Pattern Drafting 2

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
FAS3040	Contemporary Tailoring	Contemporary Tailoring
FAS3060	Couture	Couture
FAS3070	Creators of Fashion	Creators of Fashion
FAS3080	Cultural Fashions	Cultural Fashions
FAS3090	Specialty Fabrics 2	Specialty Fabrics 2
FAS3140	Fashion Retailing	Fashion Retailing
	FINANCIAL MANAGEMENT	
FIN1010	Financial Information	Financial Information
FIN1020	Service Business 1	Service Business 1
FIN1030	Service Business 2	Service Business 2
FIN2010	Taxation (Personal & Small Business)	Taxation
FIN2020	Merchandising Business 1	Merchandising Business 1
FIN2030	Merchandising Business 2	Merchandising Business 2
FIN2040	Financial Software	Financial Software
FIN2050	Financial Simulation	Financial Simulation
FIN3010	Advanced Accounting	Advanced Accounting
FIN3020	Management Accounting	Management Accounting
FIN3030	Business Organizations	Business Organizations
FIN3040	Financial Statements	Financial Statements
FIN3060	Financial Analysis	Financial Analysis
FIN3070	Financial Planning	Financial Planning
	FOODS	
FOD1010	Food Basics	Food Basics
FOD1020	Baking Basics	Baking Basics
FOD1030	Snacks & Appetizers	Snacks & Appetizers
FOD1040	Meal Planning 1	Meal Planning 1
FOD1050	Fast & Convenience Foods	Fast & Convenience Foods
FOD1060	Canadian Heritage Foods	Canadian Heritage Foods
FOD2010	Food & Nutrition Basics	Food & Nutrition Basics
FOD2020	Nutrition & the Athlete	Nutrition & the Athlete
FOD2030	Food Decisions & Health	Food Decisions & Health
FOD2040	Cake & Pastry	Cake & Pastry
FOD2050	Yeast Breads & Rolls	Yeast Breads & Rolls
FOD2060	Milk Products & Eggs	Milk Products & Eggs
FOD2070	Stocks, Soups & Sauces	Stocks, Soups & Sauces
FOD2080	Vegetables/Fruits/Grains	Vegetables/Fruits/Grains
FOD2090	Creative Cold Foods	Creative Cold Foods
FOD2100	Basic Meat Cookery	Basic Meat Cookery
FOD2110	Fish & Poultry	Fish & Poultry
FOD2120	Meal Planning 2	Meal Planning 2
FOD2130	Vegetarian Cuisine	Vegetarian Cuisine
FOD2140	Rush Hour Cuisine	Rush Hour Cuisine
FOD2150	Food Safety & Sanitation	Food Safety & Sanitation
FOD2160	Food Venture	Food Venture
FOD2170	International Cuisine 1	International Cuisine 1
FOD3010	Food for the Life Cycle	Food for the Life Cycle

* Module names are abbreviated when necessary to comply this the 25 characters required on the student's transcript/detailed profile.

MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
FOD3020	Nutrition & Digestion	Nutrition & Digestion
FOD3030	Creative Baking	Creative Baking
FOD3040	Advanced Yeast Products	Advanced Yeast Products
FOD3050	Advanced Soups & Sauces	Advanced Soups & Sauces
FOD3060	Food Presentation	Food Presentation
FOD3070	Short Order Cooking	Short Order Cooking
FOD3080	Advanced Meat Cookery	Advanced Meat Cookery
FOD3090	Basic Meat Cutting	Basic Meat Cutting
FOD3100	Entertaining with Food	Entertaining with Food
FOD3110	Food Processing	Food Processing
FOD3120	Food Evolution/Innovation	Food Evolution/Innovation
FOD3130	The Food Entrepreneur	The Food Entrepreneur
FOD3140	International Cuisine 2	International Cuisine 2
	FORESTRY	
FOR1010	Why Forestry?	Why Forestry
FOR1020	Forest Regions of Canada	Forest Regions of Canada
FOR1040	Woods Survival 1 (Survival Skills)	Woods Survival 1
FOR1050	Mapping & Aerial Photos	Mapping & Aerial Photos
FOR1060	Measuring the Forest 1 (Measurement Skills)	Measuring the Forest 1
FOR1090	Forest Ecology 1 (Ecosystem Dynamics)	Forest Ecology 1
FOR1100	Forests Forever 1 (Forest Use & Protection)	Forests Forever 1
FOR2010	Making a Difference (Protection & Stewardship)	Making a Difference
FOR2030	Managing Alberta Forests	Managing Alberta Forests
FOR2040	Woods Survival 2 (Wilderness Excursion)	Woods Survival 2
FOR2060	Measuring the Forest 2 (Sampling Techniques)	Measuring the Forest 2
FOR2070	Harvest Practices (Fibre Harvest & Processing)	Harvest Practices
FOR2100	Forests Forever 2 (Management Practices	Forests Forever 2
FOR2120	Users in the Forest	Users in the Forest
FOR3010	Issues in Forestry	Issues in Forestry
FOR3060	Measuring the Forest 3 (Survey Applications)	Measuring the Forest 3
FOR3070	The Forest Marketplace	The Forest Marketplace
FOR3080	Forest Technology Applications	Forest Techno Application
FOR3090	Forest Ecology 2 (Silvics & Succession)	Forest Ecology 2
FOR3110	Silviculture (Growing the Forest)	Silviculture
FOR3120	Integrated Resource Management (Balancing Needs)	Integrated Resource Mgmt
	INFORMATION PROCESSING	
INF1010	Computer Operations	Computer Operations
INF1020	Keyboarding 1	Keyboarding 1
INF1030	Word Processing 1	Word Processing 1
INF1040	Graphics Tools	Graphics Tools
INF1050	Database 1	Database 1
INF1060	Spreadsheet 1	Spreadsheet 1
INF1070	Hypermedia Tools	Hypermedia Tools
INF1080	Programming 1	Programming 1
INF1090	Information Highway 1	Information Highway 1
INF2010	Workstation Operations	Workstation Operations

* Module names are abbreviated when necessary to comply this the 25 characters required on the student's transcript/detailed profile.

MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
INF2030	Keyboarding 2	Keyboarding 2
INF2040	Keyboarding 3	Keyboarding 3
INF2050	Word Processing 2	Word Processing 2
INF2060	Electronic Publishing 1	Electronic Publishing 1
INF2070	Database 2	Database 2
INF2080	Spreadsheet 2	Spreadsheet 2
INF2090	Correspondence	Correspondence
INF2100	Reports	Reports
INF2110	Tables/Forms	Tables/Forms
INF2120	Software Integration 1	Software Integration 1
INF2130	Multimedia Authoring 1	Multimedia Authoring 1
INF2140	Process Control	Process Control
INF2150	Programming 2	Programming 2
INF2160	Programming 3	Programming 3
INF2170	Programming 4	Programming 4
INF2180	Programming 5	Programming 5
INF2190	Telecommunications 1	Telecommunications 1
INF2200	Information Highway 2	Information Highway 2
INF3010	Hardware/Software Analysis	HardwareSoftware Analysis
INF3020	Local Area Networks	Local Area Networks
INF3030	Keyboarding 4	Keyboarding 4
INF3040	Keyboarding 5	Keyboarding 5
INF3050	Keyboarding 6	Keyboarding 6
INF3060	Word Processing 3	Word Processing 3
INF3070	Electronic Publishing 2	Electronic Publishing 2
INF3080	Information Management Tools	Info Management Tools
INF3090	Software Integration 3	Software Integration 3
INF3100	Specialization 1	Specialization 1
INF3110	Specialization 2	Specialization 2
INF3120	Software Integration 2	Software Integration 2
INF3130	Multimedia Authoring 2	Multimedia Authoring 2
INF3140	Expert Systems	Expert Systems
INF3150	Programming Application 1	Programming Application 1
INF3160	Programming Application 2	Programming Application 2
INF3170	Programming Application 3	Programming Application 3
INF3180	Telecommunications 2	Telecommunications 2
INF3190	Information Highway 3	Information Highway 3
INF3200	Internet Services	Internet Services
LEGAL STUDIES		
LGS1010	You & the Law 1 (as a Consumer and as a Family Member)	You & the Law 1
LGS1020	You & the Law 2 (in Society and in the Workplace)	You & the Law 2
LGS2010	Family Law	Family Law
LGS2020	Labour Law	Labour Law
LGS2030	Environmental Law	Environmental Law
LGS2050	Law & the Traveller	Law & the Traveller
LGS3010	Consumer & Property Law	Consumer & Property Law

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
LGS3020	Dispute Resolution	Dispute Resolution
LGS3040	Negligence	Negligence
LGS3050	Law & Small Business	Law & Small Business
LGS3060	Controversy & Change	Controversy & Change
LGS3070	Landmark Decisions	Landmark Decisions
LGS3080	Criminal Law	Criminal Law
LOGISTICS		
LOG1010	Logistics	Logistics
LOG1020	Warehouse & Distribute 1	Warehouse & Distribute 1
LOG1030	Traffic & Transport 1	Traffic & Transport 1
LOG1040	Purchasing 1	Purchasing 1
LOG2010	Warehouse & Distribute 2	Warehouse & Distribute 2
LOG2020	Traffic & Transport 2	Traffic & Transport 2
LOG2030	Purchasing 2	Purchasing 2
LOG2040	Inventory Management 1	Inventory Management 1
LOG3010	Warehouse & Distribute 3	Warehouse & Distribute 3
LOG3020	Traffic & Transport 3	Traffic & Transport 3
LOG3030	Purchasing 3	Purchasing 3
LOG3040	Inventory Management 2	Inventory Management 2
MANAGEMENT AND MARKETING		
MAM1010	Management & Marketing Basics	Mgmt & Mrktg Basics
MAM1020	Quality Customer Service	Quality Customer Service
MAM1030	Communication Strategies 1	CommunicationStrategies 1
MAM2010	Managing for Quality	Managing for Quality
MAM2020	Promotion: Advertising	Promotion: Advertising
MAM2030	Promotion: Visual Merchandising	Promotion: Visual Merch
MAM2040	Retail Operations	Retail Operations
MAM2050	Office Systems 1	Office Systems 1
MAM2060	Communication Strategies 2	CommunicationStrategies 2
MAM2080	Records Management 1	Records Management 1
MAM3010	The Business Organization	The Business Organization
MAM3020	Business in the Canadian Economy	Business Canadian Economy
MAM3030	Business in the Global Marketplace	Business Global Mrktplace
MAM3040	Promotion: Sales Techniques	Promo: Sales Techniques
MAM3050	Distributing Goods & Services	Distribute Goods/Services
MAM3060	Setting Up a Retail Store	Setting Up a Retail Store
MAM3070	Office Systems 2	Office Systems 2
MAM3080	Communication Strategies 3	CommunicationStrategies 3
MAM3090	Records Management 2	Records Management 2
MECHANICS		
MEC1010	Modes & Mechanisms	Modes & Mechanisms
MEC1020	Vehicle Service & Care	Vehicle Service & Care
MEC1040	Engine Fundamentals	Engine Fundamentals
MEC1090	Electrical Fundamentals	Electrical Fundamentals
MEC1110	Pneumatics & Hydraulics	Pneumatics & Hydraulics
MEC1130	Mechanical Systems	Mechanical Systems

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MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
MEC1150	Ride & Control Systems	Ride & Control Systems
MEC1160	Structures & Materials	Structures & Materials
MEC1170	Metal Forming & Finishing	Metal Forming & Finishing
MEC1190	Surface Preparation 1	Surface Preparation 1
MEC2010	Vehicle Detailing	Vehicle Detailing
MEC2020	Vehicle Maintenance	Vehicle Maintenance
MEC2030	Lubrication & Cooling	Lubrication & Cooling
MEC2040	Fuel & Exhaust Systems	Fuel & Exhaust Systems
MEC2050	Alternate Fuel Engines	Alternate Fuel Engines
MEC2060	Ignition Systems	Ignition Systems
MEC2070	Emission Controls	Emission Controls
MEC2090	Electrical Components	Electrical Components
MEC2100	Power Assist Accessories	Power Assist Accessories
MEC2110	Braking Systems	Braking Systems
MEC2120	Hydraulic Accessories	Hydraulic Accessories
MEC2130	Drive Trains	Drive Trains
MEC2140	Transmissions/Transaxles	Transmissions/Transaxles
MEC2150	Suspension Systems	Suspension Systems
MEC2160	Steering Systems	Steering Systems
MEC2170	Metal Repair & Finishing	Metal Repair & Finishing
MEC2180	Trim Replacement	Trim Replacement
MEC2190	Surface Preparation 2	Surface Preparation 2
MEC2200	Refinishing 1	Refinishing 1
MEC2210	Touch-up & Finishing	Touch-up & Finishing
MEC2220	Interior Repairs	Interior Repairs
MEC3010	Buying & Selling Vehicles	Buying & Selling Vehicles
MEC3020	Vehicle Value Appraisal	Vehicle Value Appraisal
MEC3030	Engine Diagnosis	Engine Diagnosis
MEC3040	Engine Tune-up	Engine Tune-up
MEC3050	Engine Replacement	Engine Replacement
MEC3060	Engine Reconditioning 1	Engine Reconditioning 1
MEC3070	Engine Reconditioning 2	Engine Reconditioning 2
MEC3080	Alternative Energy Systems	Alternative Energy Systems
MEC3090	Computer Systems	Computer Systems
MEC3100	Safety Systems	Safety Systems
MEC3110	Climate Control	Climate Control
MEC3120	Power Assisting	Power Assisting
MEC3130	Automatic Transmissions	Automatic Transmissions
MEC3140	Drive Train Repair	Drive Train Repair
MEC3150	Wheel Alignment	Wheel Alignment
MEC3160	Body Repair Estimation	Body Repair Estimation
MEC3170	Damage Analysis	Damage Analysis
MEC3180	Damage Repair 1	Damage Repair 1
MEC3190	Damage Repair 2	Damage Repair 2
MEC3200	Refinishing 2	Refinishing 2
MEC3210	Plastic & Fibreglass	Plastic & Fibreglass

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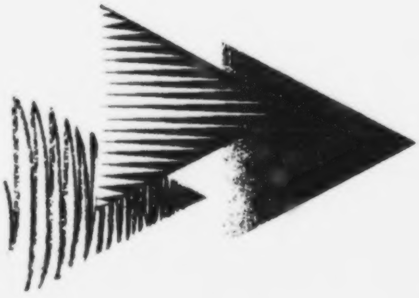
MODULE CODE	MODULE NAMES	MODULE NAMES ON PROFILE*
MEC3220	Glass Replacement	Glass Replacement
MEC3230	Refinishing 3	Refinishing 3
	TOURISM STUDIES	
TOU1010	The Tourism Industry	The Tourism Industry
TOU1020	People & Places	People & Places
TOU1030	Quality Guest Service	Quality Guest Service
TOU1040	The Food Sector	The Food Sector
TOU1050	The Accommodation Sector	The Accommodation Sector
TOU1060	The Travel Sector	The Travel Sector
TOU1070	The Attractions Sector	The Attractions Sector
TOU2010	Tourism Events	Tourism Events
TOU2040	Food Functions	Food Functions
TOU2050	Meetings & Conferences	Meetings & Conferences
TOU2060	Tourism Destinations 1	Tourism Destinations 1
TOU2070	Tourism Destinations 2	Tourism Destinations 2
TOU2080	Travel Planning	Travel Planning
TOU2090	Tourism Interpretation 1	Tourism Interpretation 1
TOU2100	Tourism Interpretation 2	Tourism Interpretation 2
TOU3030	Food Service Operations	Food Service Operations
TOU3040	Hotel/Motel Operations	Hotel/Motel Operations
TOU3050	Alternative Accommodations	Alternative Accommodation
TOU3060	Travel Agency Operations	Travel Agency Operations
TOU3070	Reservations & Ticketing	Reservations & Ticketing
TOU3080	Air Transportation	Air Transportation
TOU3090	Surface Transportation	Surface Transportation
TOU3100	Attractions Operations	Attractions Operations
TOU3110	Adventure & Ecotourism	Adventure & Ecotourism
	WILDLIFE	
WLD1010	What Is Wildlife?	What Is Wildlife
WLD1020	Natural History of Wildlife	Natural History Wildlife
WLD1030	Outdoor Experiences 1 (Survival Skills)	Outdoor Experiences 1
WLD1050	Taking Responsibility (People, Culture & Wildlife)	Taking Responsibility
WLD1070	Hunting & Game Management 1 (Ethics/Game Identification)	Hunting/Game Management 1
WLD1080	Angling & Fish Management	Angling/Fish Management
WLD2020	Measuring the Value (Diversity of Wildlife Values)	Measuring the Value
WLD2030	Outdoor Experiences 2 (Wilderness Excursion)	Outdoor Experiences 2
WLD2040	Wildlife Spaces & Species	Wildlife Spaces & Species
WLD2060	Interactions (Wildlife & Society)	Interactions
WLD2070	Hunting & Game Management 2 (Field Techniques/Regulations)	Hunting/Game Management 2
WLD2090	Issues in Wildlife 1 (Research & Analysis)	Issues in Wildlife 1
WLD3020	Making a Difference (Protection & Stewardship)	Making a Difference
WLD3040	Wildlife Research	Wildlife Research
WLD3050	Wildlife Management 1 (Basic Principles)	Wildlife Management 1
WLD3060	Wildlife Management 2 (Applications)	Wildlife Management 2
WLD3090	Issues in Wildlife 2 (Negotiation & Debate)	Issues in Wildlife 2

* Module names are abbreviated when necessary to comply this the 25 characters required on the student's transcript/detailed profile.



CAREER AND TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 3:

CTS IN JUNIOR HIGH SCHOOL

August 1997 (Interim)

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PURPOSE:

This document has been designed to assist teachers and school administrators develop and implement a successful junior high school Career and Technology Studies program.

The information outlined in this document reflects program requirements by Alberta Education and recommendations of the CTS Team. The ideas and suggestions provided are not intended to limit the program emphasis or selection of modules that a school might give. Each school is encouraged to develop a junior high school CTS program which is in keeping with student and community needs.

CTS Team
August 1997

Questions or comments about this *Manual for Administrators, Counsellors and Teachers* are welcomed and should be directed to:

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A. PROGRAM REQUIREMENTS

The mandate of education, ECS to grade 9 "…is to ensure that students learn the skills and knowledge needed to be self-reliant, responsible, caring and contributing members of society." (*Guide to Education: ECS to Grade 12 Handbook, 1997.*)

The development of school programs that meet the educational needs of students takes place at two levels – the provincial level, which establishes programs of studies that apply to all students, and the local level, which makes decisions about the effective delivery of required and complementary programs for individual students.

According to the *Guide to Education: ECS to Grade 12 Handbook; 1997* junior high schools must provide access to 950 hours of instruction per year in each grade.

Required Courses

Recommended time allotment (hours per year) for each part of junior high program is:

Language Arts	150 hours or more per year
Mathematics	100 hours or more per year
Science	100 hours or more per year
Social Studies	100 hours or more per year
Physical Education	75 hours or more per year
Complementary Courses	150 hours or more per year
Health & Personal Life Skills	150 hours or more over three years

Complementary Courses

Junior high schools are encouraged to offer a balanced program. In addition to the required courses, schools must offer two provincially authorized complementary courses for a recommended time of 75 hours per year for each course.

See page A1-1 (Guide to Education: ECS to Grade 12 Handbook; 1997) for the mission and mandate statements.

Besides helping student achieve the learning expectations described in the mission and mandate of education, complementary courses reinforce the learnings in the required courses as well as address learnings not found in core areas.

The present complementary courses available to junior high schools are as follows:

Practical Arts courses will be replaced by Career and Technology Studies (CTS) strands in the 1997-98 school year.

Practical Arts:
- Agriculture: Land and Life
- Business Studies 9
- Computer Studies
- Home Economics
- Industrial Education

Fine and Performing Arts
- Art
- Drama
- Music
  - Choral
  - General
  - Instrumental

Second Languages:
- French
- German
- Ukrainian

Native Languages
- Blackfoot Language and Culture Program
- Cree Language and Culture Program

Other
- Environmental and Outdoor Education
- Ethics
- Religious Studies
- Locally Developed/Acquired Authorized Courses

Note: When instruction in a language is offered, only one complementary course is required other than English (Guide to Education: ECS to Grade 12 Handbook1997).

Since Career and Technology Studies is part of the junior high school complementary course selection, student could access, over a three-year period, 450 hours of learning. Within this time frame, students could readily develop the competencies, in all or in part, for a significant number of modules in CTS strands while in junior high school.

B. CAREER AND TECHNOLOGY STUDIES COURSES

CTS has been developed to help schools, through new and revised programs, respond to the technological changes in our society that affect present and future career opportunities.

Courses Affected by CTS

Career and Technology Studies will replace the following junior high school practical arts courses in September 1997.

Chart B-1: Practical Arts Courses Affected by CTS Strands

Practical Arts	CTS Strands
Agriculture: Land and Life 7, 8, 9	Agriculture
Business Studies 9	Management & Marketing Enterprise and Innovation
Computer Studies 7, 8, 9	Information Processing
Home Economics 7, 8, 9	
Family Studies	Community Health
Clothing	Fashion Studies
Foods	Foods
Industrial Education 7, 8, 9	
Visual Communication	Communication Technology
Materials	Design Studies Construction Technologies
Power	Fabrication Studies Electro-Technologies Mechanics

New Strands

In addition to the revised courses, a number of new CTS strands have been made available to students in junior high school.

Program Structure

CTS is a results-based curriculum that is built around 22 strands, representing different economic sectors and/or common fields of study. The strands are organized into modules at the introductory, intermediate and advanced levels. Each module takes approximately 25 hours to complete.

Since the curriculum structure in CTS is organized into levels, not grades, the competencies students develop in junior high school can form the foundation for further development and enhancement at the high school level.

Program Planning

Junior high schools will decide the level of breadth and depth in the CTS strands that students can access. Because few junior high students have made specific career decisions and plans, they will be better able to learn about different career areas if they can explore several of the CTS strands along with other complementary programs.

All CTS strands can be delivered at the junior high school level, although some strands have a more specialized occupational focus and may be less relevant to the junior high school student.

Schools are encouraged to continue in Grade 8 and 9 with at least one of the complementary courses selected in Grade 7.

Introductory level modules are considered most appropriate for junior high school students because they focus on developing competencies that are useful for daily living and form a foundation for further study within the strand.
Junior high schools may also deliver intermediate level modules, particularly in strands such as Information Processing when students have developed competencies during their elementary programs.

Module Selection

When selecting modules, junior high schools will need to decide if the junior high students learning experiences will be primarily exploratory or if students will be able to begin specializing career areas. With an exploratory focus, junior high students would access a broad-range of complementary programs; e.g., modules from many CTS strands, fine and performing arts, second languages etc. With a career focus, junior high students would specialize in fewer complementary programs.

Junior high schools should also take into account the strands/modules that will be available to students as they move into high school and build their programs/courses accordingly.

Modules that are suitable for junior high school students have been identified by strand in Chart B-3.

Chart B-3: Recommended Modules for Junior High Schools

CTS Strand	Basic Modules	Additional Modules*
AGRICULTURE	• Agriculture: The Big Picture • Resource Management	• Production Basics • Consumer Products & Services • Marketing Fundamentals • Agriculture Technology
CAREER TRANSITIONS	• Leading by Example • Taking the Lead • Job Preparation	• Personal Safety (Management)
COMMUNICATION TECHNOLOGY	• Media & You • Photography 1 • Presentation & Communication 1	• Special Effects Photography • Printing 1 • Audio/Video Production 1 • Animation 1
COMMUNITY HEALTH	• Child Development • Caring for Children	• Perspectives on Health • Family Dynamics • Personal Safety (Management) • First Aid/CPR
CONSTRUCTION TECHNOLOGIES	• Basic Tools & Materials • Building Construction	• Turning Operations* • Project Management * • Manufactured Materials • Solid Stock Construction* • Mold Making & Casting*
COSMETOLOGY	• Personal Images • Skin Care 1 (Basic Practices) • Manicuring 1	• Hair Graphics 1 *
DESIGN STUDIES	• Sketch, Draw & Model • The Design Process • 2 D Design Fundamentals	• 3D Design Fundamentals • CAD Fundamentals * (computer aided design) • Drafting/Design–Fundamentals
ELECTRO-TECHNOLOGIES	• Electro-Assembly 1	• Digital Technology 1* • Conversion & Distribution * • Security Systems 1* • Robotics 1 * • Digital Technology 2 * • Electronic Power Supply *

*** Note: Labs and/or specialized equipment are required for starred modules**

CTS Strand	Basic Modules	Additional Modules*
ENERGY & MINES	• Overview of Alberta Geology • Conservation Challenge	• Nonrenewable Resources • Renewable Resources • Consumer Products & Services • Fundamentals of Recycling • Conventional Oil/Gas 1 • Oil Sands/Heavy Oil/Coal 1 • Metals/Nonmetals 1 • Supply & Distribution • Market Basics & Trends • Refining Rocks & Minerals Refining Hydrocarbons • Renewable Energy Technology
ENTERPRISE & INNOVATION	• Challenge & Opportunity • Planning a Venture	• Implementing the Venture
FABRICATION STUDIES	• Basic Tools and Materials • Fabrication Principles	• Foundry 1 (One-piece pattern) • Sheet Fabrication 1* • Bar & Tubular Fabrication * • Principles of Machining * • Production Systems *
FASHION STUDIES	• Ready, Set, Sew! • Fashion Basics	• Repair & Recycle * • Creating Accessories 1 * • Creative Yarns/Textiles *
FINANCIAL MANAGEMENT	• Financial Information	
FOODS	• Food Basics * • Baking Basics *	• Snacks & Appetizers * • Meal Planning 1* • Fast & Convenience Foods * • Canadian Heritage Foods *
FORESTRY	• Why Forestry? • Forest Regions of Canada • Forests Forever I (Forest Use & Protection)	• Mapping & Aerial Photos • Measuring the Forest 1 (Measurement Skills) • Harvest Practices (Fibre Harvest & Processing) • Forest Ecology 1
INFORMATION PROCESSING	• Computer Operations * • Word Processing I *	• Graphics Tools * • Database 1* • Spreadsheet 1 * • Hypermedia Tools * • Information Highway 1 • Programming 1 * • Keyboarding 1
MANAGEMENT AND MARKETING	• Management & Marketing Basics	• Quality Customer Service • Communication Strategies 1

*** Note: Labs and/or specialized equipment are required for starred modules**

CTS Strand	Basic Modules	Additional Modules*
MECHANICS	• Modes & Mechanisms • Mechanical Systems *	• Vehicle Service & Care • Engine Fundamentals * • Electrical Fundamentals * • Pneumatics & Hydraulics * • Ride & Control Systems *
TOURISM STUDIES	• The Tourism Industry	• The Food Sector • People & Places • The Attractions Sector • Quality Guest Service
WILDLIFE	• What is Wildlife? • Natural History of Alberta Wildlife • Taking Responsibility (People, Culture & Wildlife)	• Outdoor Experiences 1 (Survival Skills) • Outdoor Experiences 2 (Wilderness Excursion) • Measuring the Value (Diversity of Wildlife Values) • Hunting & Game Management 1 (Ethics/Game Identification) • Hunting & Game Management 2 (Field Techniques/ Regulations) • Wildlife Spaces & Species • Angling & Fish Management • Issues in Wildlife I (Research & Analysis)
*** Note: Labs and/or specialized equipment are required for starred modules**		

Module Packaging

Junior high schools can design CTS courses at grades 7, 8 and/or 9 which include:

- complete modules from a strand
- components of modules, and/or
- modules from one or more strands.

Complete modules may be chosen from one or more strands and taught prior to the student moving to another module. This often occurs when one module develops the knowledge skills required for other modules as in a module prerequisite.

A module does not have to be completed in a given school year in junior high schools.

Modules can be divided up and may be delivered over a two or three year period as illustrated in typical lab settings. See Chart B-4, B-5 and B-6 and Appendix G-3 and G-4.

Modules may also be chosen on the basis of themes that run across strands. These modules can be packaged in 3-,4-,5- and 6- credit blocks. Refer to Appendix F-1 to F-16 for sample Junior High School Linkages.

Chart B-4: Examples of Junior High School Program Consisting of Components of CTS Modules Taught in Typical Home Economics Lab

Strand	Grade 7	Grade 8	Grade 9
Foods	Food Basics	Food Basics	Meal Planning 1
Fashion	Ready, Set, Sew!	Fashion Basics	Ready, Set, Sew!
Community Health	Caring for Children	Child Development	Family Dynamics

Chart B-5: Examples of Junior High School Program Consisting of Components of CTS Modules Taught in Typical Industrial Education Lab

Strand	Grade 7	Grade 8	Grade 9
Construction Technologies	Basic Tools & Materials	Project Management	Building Construction
Design Studies	Sketch, Draw and Model — Fundamentals	Sketch, Draw and Model — Fundamentals	Design Process
Mechanics	Modes and Mechanisms	Modes and Mechanisms	Mechanical Systems

Chart B-6: Examples of Junior High School Program Consisting of Components of CTS Modules Taught in Typical Business Education Lab

Strand	Grade 7	Grade 8	Grade 9
Information Processing	Computer Operations	Word Processing 1	Computer Operations
Enterprise & Innovation/ Management & Marketing		Management & Marketing Basics)	Planning A Venture
Legal Studies/ Financial Management	Financial Information		Financial Information

C. STUDENT REGISTRATION

Courses offered may be named Career and Technology Studies (CTS) 7, 8 or 9 or by a specific strand name such as Agriculture 7, 8 or 9.

Experience has demonstrated that both boys and girls do equally well in CTS programs. Where possible, co-ed classes are encouraged in most CTS strands.

Timetables

CTS courses can be timetabled similar to the previous practical arts courses. Double or longer classroom periods are recommended for those strands that benefit from additional time to complete tasks efficiently such as in Foods, Fashion Studies, Construction Technologies and Fabrication Studies.

D. FACILITIES

CTS Without Labs

Many of the recommended junior high school modules do not require specialized equipment or facilities. For more details refer to the module parameters identified in each strand (section D, E and F, *Guide to Standards and Implementation*).

CTS Labs and Suites

Even though some strands and modules do not require labs, the need for specialized classrooms and suites for CTS programs will continue.

Many of these facilities should still be located on the ground floor where it is convenient to deliver materials and gain access to equipment.

In CTS suites of the future, open space will become larger and be loosely divided into workstations, research centres, computer centres, fabrication areas and adjoining seminar rooms. These facilities will facilitate a variety of teaching and learning strategies.

Planning for a CTS facility will involve a great deal of collaboration involving teachers, administrators, parents, students and other community members.

Refer to Appendix 10, Developing Facilities to Support CTS, for further information.

E. PROMOTING SMOOTH TRANSITIONS

A basic belief of the CTS program is that competencies students develop should be identified and recognized and that learning should be a continuum. Within this perspective, junior high school students who have developed the competencies defined within a module (or components of a module), or from other learning environments such as the home or the workplace, should be able to expand on or enhance those competencies as they move through their school experience.

Elementary to Junior High School

As many students entering junior high school already have CTS-related competencies developed in the elementary school years in keyboarding, computer hardware and software use, and tool use, junior high schools will need to consult with feeder schools to determine the level of expertise students will bring to their junior high school program.

Section H in each *Guide to Standards and Implementation* includes correlations to elementary programs that relate to CTS strands.

Junior High to Senior High School

Junior and senior high school administrative and teaching personnel are encouraged to share program plans and to cooperate as much as possible to ensure students can access CTS modules that allow them to explore a number of CTS strands.

Subject to local school board policy, if a student entering high school can demonstrate all the competencies required for one or more modules, the **senior high principal** can grant a high school credit for each module.

Refer to *Guide to Education: ECS to Grade 12 Handbook 1997*, (Appendix 7-2)

Modules successfully completed by students while in junior high school, for which the senior high school principal has accepted the recommendation of the junior high school principal, are to be reported by the senior high school principal as passed modules on the Report of Senior High Student Career and Technology Studies (CTS) Modules completed in Junior High School (form 94ED01.04C) and forwarded to the School Finance Branch.

Student Portfolios

Students are encouraged to develop and maintain records of completed activities in the form of a portfolio.

A portfolio should exhibit the breadth and depth of a student's capabilities and achievements. Portfolios may take several forms and include a variety of samples of student work including presentations and reports, two- and three-dimensional products and student/teacher assessments in print, slide, video tape or computer disk formats.

These records can be used to help determine whether the student has demonstrated the competencies required for a module. They may also be helpful to students to gain admission to a post-secondary program or entry into the workplace.

Credentialling

There are a few opportunities for junior high school students to earn credentials established by various professional organizations. For further information, refer to Appendix 14: Credentialling Opportunities for CTS Students document. In some cases, teachers or a community partner will need additional certification to provide the instruction and/or assessment of student competency.

Tracking and Reporting

As in all courses, student achievement in CTS will be assessed and reported to students and parents. At the junior high school level, student achievement is not reported to Alberta Education.

F. LINKAGES AMONG CTS STRANDS

There are many linkages between CTS strands. The following charts include specific modules from various CTS strands as a sample of linkages in junior high.

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Agriculture in Junior High

Course Emphasis	Agriculture Modules	Foods Modules	Mechanics Modules	Wildlife Modules
Environmental Management (3 modules)	Agriculture: The Big Picture *AGR1010* Resource Management *AGR1110*			Taking Responsibility *WLD1050*
Landscape/Turf Care (4 modules)	Agriculture: The Big Picture *AGR1010* Basic Landscape/ Turf Care *AGR1070* Agriculture Technology *AGR1100*		Engine Fundamentals *MEC1040*	
Agrifoods (5 modules)	Agriculture: The Big Picture *AGR1010* Consumer Products & Services *AGR1060* Agriculture Technology *AGR1100*	Food Basics *FOD1010* Canadian Heritage Foods *FOD1060*		
Field Crop Production (6 modules)	Agriculture: The Big Picture *AGR1010* Production Basics *AGR1030* Market Fundamentals *AGR1090* Agriculture Technology *AGR1100*		Engine Fundamentals *MEC1040* Mechanical Systems *MEC1130*	

Career Transitions in Junior High

Course Emphasis	Career Transitions Modules	Cosmetology Modules	Community Health Modules
Leadership (3 modules)	Leading by Example CTR1020	Personal Images COS1010	
	Taking the Lead CTR2020		
Integrated (4 modules)	Job Preparation CTR1010	Personal Images COS1010	
	Leading by Example CTR1020		
	Personal Safety (Management) CTR1210		
Integrated (5 modules)	Leading by Example CTR1020	Personal Images COS1010	Caring for Children CMH1040
	Taking the Lead CTR2020		
	Personal Safety (Management) CTR1210		

Construction Technologies in Junior High

Course Emphasis	Construction Technologies Modules	Design Studies Modules	Fabrication Studies Modules	Forestry Modules
Production (3 modules)	Basic Tools & Materials (CON1010)		Production Systems (FAB1160)	
	Building Construction (CON1070)			
Planning and Management (4 modules)	Project Management (CON1120)	Sketch, Draw & Model (DES1010)	Basic Tools & Materials (CON1010)	
	Solid Stock Construction (CON1130)			
Carpentry (6 modules)	Building Construction (CON1070)	Sketch, Draw & Model (DES1010)	Basic Tools & Materials (CON1010)	
	Solid Stock Construction (CON1130)			
	Manufactured Materials (CON1160)			
Cabinetry (6 modules)	Project Management (CON1120)	Sketch, Draw & Model (DES1010)	Basic Tools & Materials (CON1010)	Harvest Practices (Fibre Harvesting and Processing) (FOR2070)
	Solid Stock Construction (CON1130)			
	Turning Operations (CON1140)			

Cosmetology Studies in Junior High

Course Emphasis	**Cosmetology Studies Modules**	**Career Transitions Modules**	**Marketing & Management Modules**
Integrated (3 modules)	Personal Images *COS1010*	Personal Safety (Management) *CTR1210*	
	Skin Care *COS1060*		
Integrated (4 modules)	Personal Images *COS1010*	Personal Safety (Management) *CTR1210*	
	Skin Care 1 *COS1060*		
	Manicuring 1 *COS1070*		
Integrated (5 modules)	Personal Images *COS1010*	Personal Safety (Management) *CTR1210*	Quality Customer Service *MAM1020*
	Skin Care 1 *COS1060*		
	Manicuring 1 *COS1070*		
Integrated (6 modules)	Personal Images *COS1010*	Personal Safety (Management) *CTR1210*	Quality Customer Service *MAM1020*
	Skin Care 1 *COS1060*		
	Manicuring 1 *COS1070*		
	Hair Graphics 1 *COS1020*		

Electro-Technologies in Junior High

Course Emphasis	**Electro-Technologies Modules**	**Mechanics Modules**	**Design Studies Modules**	**Construction Technologies Modules**
Electrical/ Electronic Principles (3 modules)	Electro-assembly 1 *ELT1010* Conversion & Distribution *ELT1030*	Electrical Fundamentals *MEC1090*		
Design/Prototyping (4 modules)	Electro-assembly 1 *ELT1010*	Modes & Mechanisms *MEC1010*	Sketch, Draw & Model *DES1010*	Basic Tools & Materials *CON1010*

Course Emphasis	**Electro-Technologies Modules**	**Information Processing Modules**	**Design Studies Modules**	**Construction Technologies Modules**
Computers/Uses (5 modules)	Digital Technology 1 *ELT1060* Computer Technology *ELT2070*	Computer Operations *INF1010* Keyboarding 1 *INF1020*	CAD Fundamentals *DES1050*	

Course Emphasis	**Electro-Technologies Modules**	**Mechanics Modules**	**Energy & Mines Modules**	**Construction Technologies Modules**
Energy Conversion/Uses (6 modules)	Electro-assembly 1 *ELT1010* Conversion & Distribution *ELT1030* Electronic Power Supply 1 *ELT1050*	Electrical Fundamentals *MEC1090*	Overview of Alberta Geology *ENM1010*	Basic Tools & Materials *CON1010*

Energy and Mines in Junior High

Course Emphasis	Energy & Mines Modules	Forestry Modules	Fabrication Studies Modules	Mechanics Modules
Conservation and Management (3 modules)	Fundamentals of Recycling *ENM1090* Conservation Challenge *ENM1100*	Forests Forever 1 *FOR1100*		
Conventional Exploration and Recovery (6 modules)	Overview of Alberta Geology *ENM1010* Nonrenewable Resources *ENM1020* Conventional Oil/Gas 1 *ENM2020* Supply & Distribution *ENM2080*	Mapping & Aerial Photos *FOR1050*		Mechanical Systems *MEC1130*
Refining and Manufacturing Processes (4 modules)	Consumer Products & Services *ENM1060* Refining Hydrocarbons *ENM2060* Environmental Safety *ENM2100*		Production Systems *FAB1160*	
Renewable Energy (5 modules)	Overview of Alberta Geology *ENM1010* Renewable Resources *ENM1050* Renewable Energy Technology *ENM2050*		Basic Tools & Materials *CON1010*	Mechanical Systems *MEC1130*

Enterprise and Innovation in Junior High

Course Emphasis	Enterprise & Innovation Modules	Management & Marketing Modules
Leadership (3 modules)	Challenge & Opportunity *ENT1010*	Management & Marketing Basics *MAM1010*
	Planning a Venture *ENT1020*	
Making It Happen (4 modules)	Challenge & Opportunity *ENT1010*	Quality Customer Service *MAM1020*
	Planning a Venture *ENT1020*	
	Implementing the Venture *ENT2040*	

Fabrication Studies in Junior High

Course Emphasis	Fabrication Studies Modules	Construction Technologies Modules	Design Studies Modules	Energy & Mines Modules
Fabrication & Production Systems (3 modules)	Fabrication Principles (FAB1100) Production Systems (FAB1160)	Basic Tools & Materials (CON1010)		
Production & Processes (4 modules)	Foundry 1 (FAB1120) Principles of Machining (FAB1130)	Basic Tools & Materials (CON1010)		Fundamentals of Recycling (ENM1090)
Fabrication Processes (5 modules)	Fabrication Principles (FAB1100) Basic Tools & Materials (CON1010) Sheet Fabrication (FAB1090)	Basic Tools & Materials (CON1010)	Sketch, Draw & Model (DES1010)	
Planning & Management (6 modules)	Sheet Fabrication 1 (FAB1090) Bar & Tubular Fabrication (FAB1110) Principles of Machining (FAB1130)	Basic Tools & Materials (CON1010) Project Management (CON1120)	Sketch, Draw & Model (DES1010)	

Fashion Studies in Junior High

Course Emphasis	Fashion Studies Modules	Design Studies Modules	Management & Marketing Modules
Production (3 modules)	Ready, Set, Sew! *FAS1030*		
	Fashion Basics *FAS1040*		
	Repair & Recycle *FAS1050*		
Production (4 modules)	Creating Home Decor *FAS2110*	Sketch Draw & Model *DES1010*	
	Creative Yarns/ Textiles *FAS1070*	CAD Fundamentals (Computer-aided Design) *DES1050*	
Merchandising (2 modules)			Management & Marketing Basics *MAM1010*
			Quality Customer Service *MAM1020*

Foods in Junior High

Course Emphasis	Foods Modules	Community Health Modules	Tourism Studies Modules	Agriculture Modules
Nutrition (2 modules)	Food Basics *FOD1010*			
		Perspectives on Health *CMH1080*		
Preparation and Presentation (3 modules)	Baking Basics *FOD1020*		Quality Guest Service *TOU1030*	
	Snacks & Appetizers *FOD1030*			
Management (7 modules)	Meal Planning 1 *FOD1040*	Personal Safety (Management) *CTR1210*	The Food Sector *TOU1040*	Consumer Products & Services *AGR1060*
	Fast & Convenience Foods *FOD1050*			Agriculture: The Big Picture *AGR1010*
				Agriculture Technology *AGR1100*
Social and Cultural (2 modules)	Canadian Heritage Foods *FOD1060*	Family Dynamics *CMH1010*		

Forestry in Junior High

Course Emphasis	Forestry Modules	Mechanics Modules	Wildlife Modules	Tourism Studies Modules
Forest Ecology (3 modules)	Why Forestry? *FOR1010* Forest Ecology 1 *FOR1090*		Natural History of Wildlife *WLD1020*	
Forest Inventory (4 modules)	Why Forestry? *FOR1010* Mapping & Aerial Photos *FOR1050* Measuring the Forest 1 *FOR1060*		Measuring the Value *WLD2020*	
Logging and Timber Utilization (5 modules)	Why Forestry? *FOR1010* Forest Regions of Canada *FOR1020* Harvest Practices *FOR2070*	Engine Fundamentals *MEC1040* Mechanical Systems *MEC1130*		
Personal and Recreational Use (6 modules)	Why Forestry? *FOR1010* Mapping & Aerial Photos *FOR1050* Woods Survival 1 *FOR1040* Woods Survival 2 *FOR2040*		Angling & Fish Management *WLD1080*	The Attractions Sector *TOU1070*

Information Processing in Junior High

Course Emphasis	Information Processing Modules	Management & Marketing Modules	Communication Technology Modules	Design Studies Modules
(Theme 1) Design (3 modules)	Computer Operations *INF1010*			The Design Process *DES1020*
	Graphics Tools *INF1040*			

Course Emphasis	Information Processing Modules	Management & Marketing Modules	Communication Technology Modules	Electro-Technologies Modules
(Theme 2) Programming (4 modules)	Computer Operations *INF1010*			Digital Technology 1 *ELT1060*
	Programming 1 *INF1080*			Robotics 1 *ELT1130*
(Theme 3) Written Communications (5 modules)	Computer Operations *INF1010*	Communication Strategies 1 *MAM1030*		
	Keyboarding 1 *INF1020*			
	Word Processing 1 *INF1030*			
	Information Highway 1 *INF1090*			

Course Emphasis	Information Processing Modules	Management & Marketing Modules	Communication Technologies Modules	Design Studies Modules
(Theme 4) Visual Communication (5 modules)	Graphics Tools *INF1040*		Presentation & Comm 1 *COM1010*	The Design Process *DES1020*
	Hypermedia Tools *INF1070*		Animation 1 *COM1070*	

Management and Marketing in Junior High

Course Emphasis	Management & Marketing Modules	Enterprise & Innovation Modules	Information Processing Modules	Financial Management Modules
(Theme 1) Retailing (3 modules)	Management & Marketing Basics *MAM1010*	Challenge & Opportunity *ENT1010*		
	Quality Customer Service *MAM1020*			
(Theme 2) Venture Planning (4 modules)	Management & Marketing Basics *MAM1010*	Challenge & Opportunity *ENT1010*		Financial Information *FIN1010*
		Planning a Venture *ENT1020*		
(Theme 3) Communication (6 modules)	Communication Strategies 1 *MAM1030*	Challenge & Opportunity *ENT1010*	Computer Operations *INF1010*	
			Keyboarding 1 *INF1020*	
			Word Processing 1 *INF1030*	
			Information Highway 1 *INF1090*	

Course Emphasis	Management & Marketing Modules	Enterprise & Innovation Modules	Information Processing Modules	Tourism Studies Modules
(Theme 4) Tourism (5 modules)	Management & Marketing Basics *MAM1010*	Challenge & Opportunity *ENT1010*		The Tourism Industry *TOU1010*
				People & Places *TOU1020*
				Quality Guest Service *TOU1030*

Mechanics in Junior High

Course Emphasis	Mechanics Modules	Electro-Technologies Modules	Communication Technology Modules	Design Studies Modules
Vehicle Ownership (3 modules)	Modes & Mechanisms *MEC1010* Vehicle Service & Care *MEC1020*	Electro-assembly 1 *ELT1010*		
Engine / Motors (4 modules)	Modes & Mechanisms *MEC1010* Vehicle Service & Care *MEC1020* Engine Fundamentals *MEC1040*	Electro-assembly 1 *ELT1010*		
Electricity / Electronics (5 modules)	Modes & Mechanisms *MEC1010* Electrical Fundamentals *MEC1090*	Electro-assembly 1 *ELT1010*		Sketch, Draw & Model *DES1010* The Design Process *DES1020*
Energy Conversion / Uses (6 modules)	Modes & Mechanisms *MEC1010*	Electro-assembly 1 *ELT1010*	Media & You *COM1020*	Sketch, Draw & Model *DES1010* The Design Process *DES1020*

Wildlife in Junior High

Course Emphasis	Wildlife Modules	Community Health Modules	Forestry Modules	Tourism Studies Modules
Literature, Art and Film (3 modules)	What is Wildlife? *WLD1010* Natural History of Wildlife *WLD1020*			The Attractions Sector *TOU1070*
Recreation (4 modules)	What is Wildlife? *WLD1010* Outdoor Experiences 1 *WLD1030* Outdoor Experiences 2 *WLD2030*	First Aid/ CPR *CMH2120*		
Resource Harvest (5 modules)	What Is Wildlife? *WLD1010* Hunting & Game Management 1 *WLD1070* Hunting & Game Management 2 *WLD2070* Taking Responsibility *WLD1050*	First Aid CPR *CMH2120*		
Conservation and Management (6 modules)	What Is Wildlife? *WLD1010* Wildlife Spaces & Species *WLD2040* Taking Responsibility *WLD1050* Issues in Wildlife 1 *WLD2090*		Forest Regions of Canada *FOR1020* Forests Forever 1 *FOR1100*	

ATTACHMENTS

Sample Junior High Program

Leduc Junior High School 31

Cardinal Leger Junior High School 32

Nickle Junior High School........ 33

LEDUC JUNIOR HIGH SCHOOL

Design and Technology Lab Module Flow Chart

	GRADE 7	GRADE 8	GRADE 9
REQUIRED	Gr. 7 Orientation + Shop Safety * Basic Tools & Materials CON1010 (Bank, Box, B/Feeder)	Gr. 8 Orientation + Shop Safety Sketch, Draw & Model - DES1010 (CO_2 Car)	Gr. 9 Orientation + Shop Safety
OPTIONAL	Modes & Mechanisms MEC1010 (Solid Fuel Rocketry) Electro-Assembly 1 ELT1010 (Cyborg & Tasks)	2D Design Fundamentals DES1030 (Jeeps or Metals) Solid Stock Construction CON1130 (Gumball Machine) Media & You COM1020 (Digital & Light Photography)	Project Management CON1120 (Adirondack Chair) Security Systems 1 ELT1110 (Burglar Alarm/Sensors) Engine Fundamentals MEC1040 (Small Engines) 2D Design Fundamentals DES1030 (Multistage Rocketry)
AVAILABLE	Turning Operations CON1140 (Bowl & Spindle Turning)	* Any module that you did not previously take in Grade 7.	* Any modules that you did not complete in Grade 7 or 8.

* Mandatory, non-credit, short term modules that are required for students to work in the shop.

CARDINAL LEGER JUNIOR HIGH SCHOOL

1995 – 96 Option Program

Grade 7 (3 @ 75 = 225 hours)

Students choose one different option from each of the A, B & C categories.

	A	B	C
1	French	French	French
2	Music	Music	Music
3	CTS – F&F	CTS – F&F	CTS – F&F
4	CTS – TE	CTS – TE	CTS – TE
5	CTS – Inf. Pro.	CTS – Inf. Pro.	CTS – Inf. Pro.
6	CTS – Entrep	Italian	CTS – Entrep

Grade 8 (3 @ 75 = 225 hours)

Students choose one different option from each of the A & B categories. Category C is mandatory.

	A	B	C
1	Italian	CTS-Entrep	*CTS Multioption*
2	French	French	*Foods*
3	Music	Music	*Design Studies*
4	CTS – F&F	CTS – F&F	*Tech Wheel*
5	CTS – TE	CTS – TE	*Info Process*
6	CTS – Inf. Pro.	CTS – Inf. Pro.	*Energy & Mines*

Grade 9 (3 @ 75 = 225 hours)

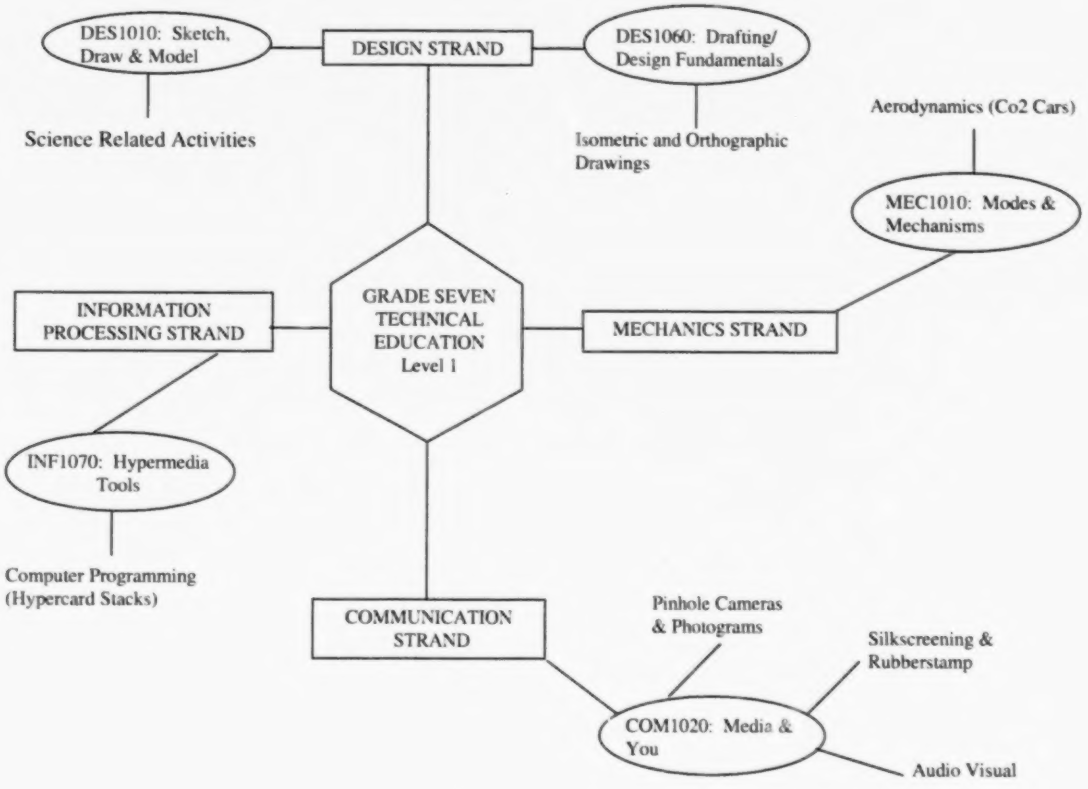
Students choose one option from each of the A & B categories. Category C is mandatory.

	A	B	C
1	Music	Italian	*CTS Multioption*
2	French	French	*Foods*
3	CTS – F&F	CTS – F&F	*Design Studies*
4	CTS – TE	CTS – TE	*Tech Wheel*
5	CTS – Inf. Pro.	CTS – Inf. Pro.	*Info Process*
6	CTS – Entrep	CTS – Entrep	*Wildlife*

F&F – Foods and Fashion
TE – Technical Education

NICKLE JUNIOR HIGH SCHOOL

(Grade 7 Technical Education Program)


DES1010: Sketch, Draw & Model
DESIGN STRAND
DES1060: Drafting/ Design Fundamentals
Science Related Activities
Isometric and Orthographic Drawings
Aerodynamics (Co2 Cars)
MEC1010: Modes & Mechanisms
INFORMATION PROCESSING STRAND
GRADE SEVEN TECHNICAL EDUCATION Level 1
MECHANICS STRAND
INF1070: Hypermedia Tools
Computer Programming (Hypercard Stacks)
COMMUNICATION STRAND
Pinhole Cameras & Photograms
Silkscreening & Rubberstamp
COM1020: Media & You
Audio Visual

The “Technical Education” cluster at Nickle Junior High is composed of modules from:

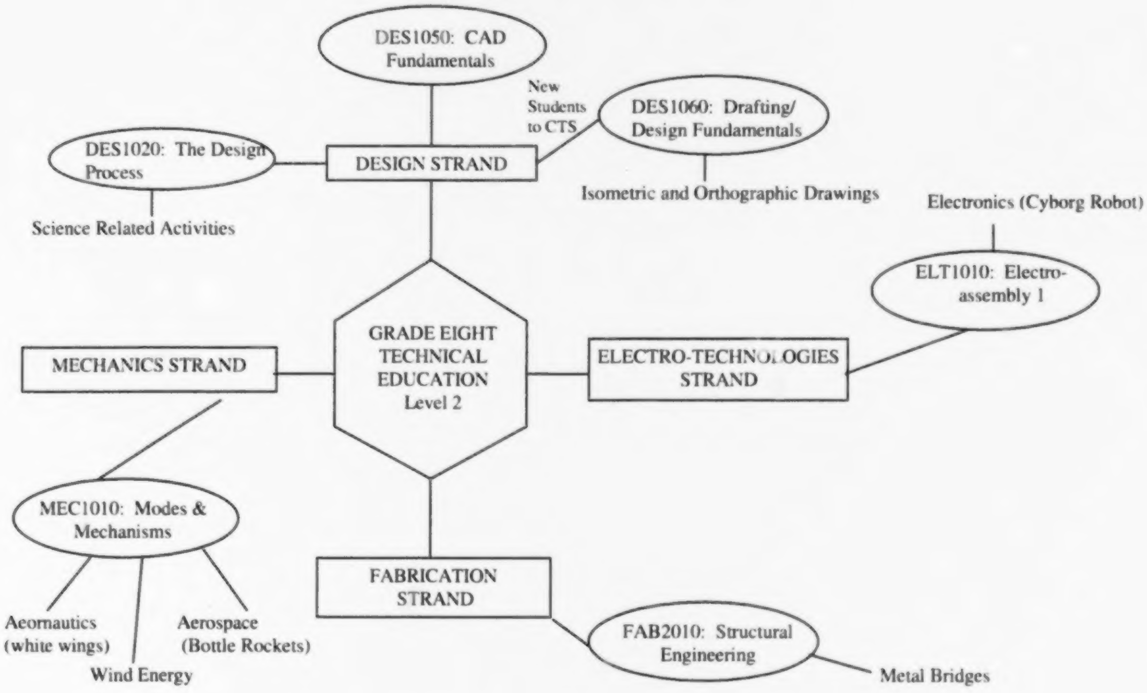
- Design Studies
- Information Processing
- Communication Technology
- Mechanics
- Electro-Technologies
- Fabrication Studies

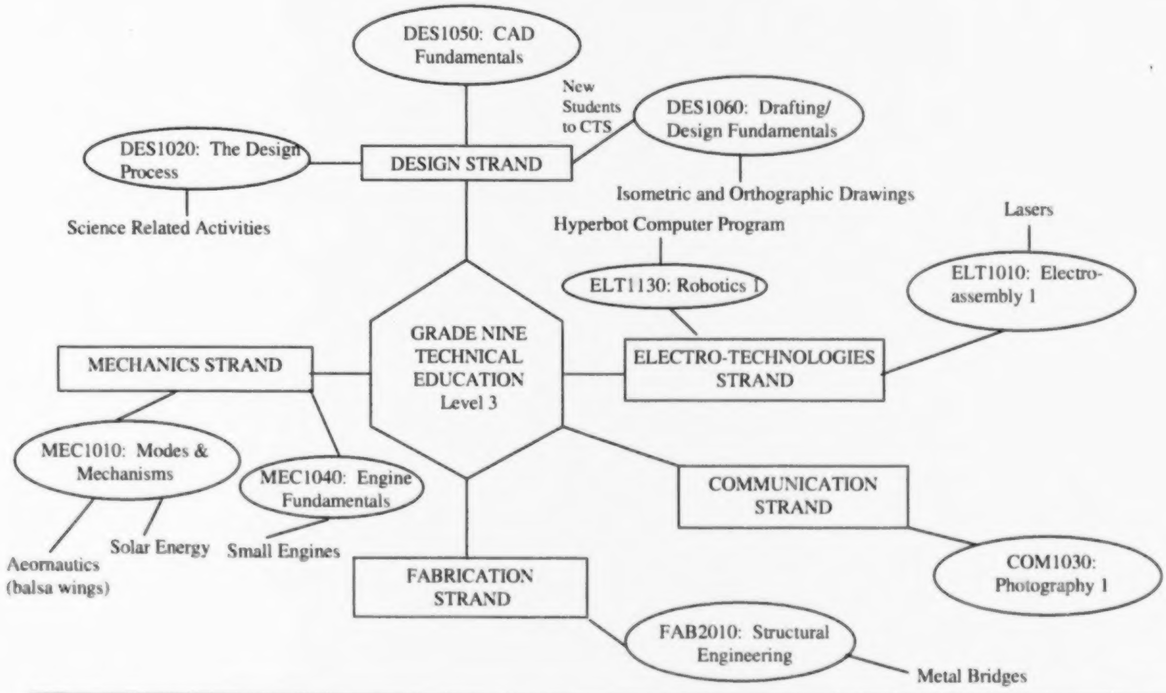
Because of the importance of drawing skills, all students are required to develop and demonstrate the competencies in Drafting/Design Fundamentals (DES1060). Once these have been achieved, students move on to other modules in this cluster.

As outlined on this and the following grade 8 and 9 charts, students engage in activities at all three levels to complete a module such as Modes & Mechanisms (MEC1010). Others, like CAD Fundamentals (DES1050) require work to be completed in grade 8 and 9 (refer to Appendix G-4).

NICKLE JUNIOR HIGH SCHOOL

(Grade 8 and 9 Technical Education Program)


DES1050: CAD Fundamentals
New Students to CTS
DES1060: Drafting/ Design Fundamentals
DES1020: The Design Process
DESIGN STRAND
Isometric and Orthographic Drawings
Science Related Activities
Electronics (Cyborg Robot)
ELT1010: Electro-assembly 1
GRADE EIGHT TECHNICAL EDUCATION Level 2
MECHANICS STRAND
ELECTRO-TECHNOLOGIES STRAND
MEC1010: Modes & Mechanisms
FABRICATION STRAND
Aeornautics (white wings)
Aerospace (Bottle Rockets)
Wind Energy
FAB2010: Structural Engineering
Metal Bridges


DES1050: CAD Fundamentals
New Students to CTS
DES1060: Drafting/ Design Fundamentals
DES1020: The Design Process
DESIGN STRAND
Isometric and Orthographic Drawings
Science Related Activities
Hyperbot Computer Program
Lasers
ELT1130: Robotics 1
ELT1010: Electro-assembly 1
GRADE NINE TECHNICAL EDUCATION Level 3
MECHANICS STRAND
ELECTRO-TECHNOLOGIES STRAND
MEC1010: Modes & Mechanisms
MEC1040: Engine Fundamentals
COMMUNICATION STRAND
Solar Energy
Small Engines
Aeornautics (balsa wings)
FABRICATION STRAND
COM1030: Photography 1
FAB2010: Structural Engineering
Metal Bridges

ATTACHMENT

Planning and Record Keeping Charts

Sample Student Profile 37

Sample Student Planner 39

Career and Technology Studies
STUDENT PROFILE

Name: ______________________

Schools: ______________________ Date: __________

______________________ Date: __________

______________________ Date: __________

Modules Undertaken in Junior High School

Grade 7

Grade 8

Grade 9

Modules Completed in Junior High School

Modules Completed in High School

Introductory

Intermediate

Advanced

TOTAL NUMBER OF MODULES COMPLETED IN JUNIOR AND SENIOR HIGH SCHOOL

Career and Technology Studies
STUDENT PLANNER

Name: ______________________
Schools: ______________ Date: ________
______________ Date: ________
______________ Date: ________

Interest / Emphasis	Grade 7	*	Grade 8	*	Grade 9	*	Grade 10	*	Grade 11	*	Grade 12	*

* C = Module complete
I = Module incomplete

Number of modules completed successfully towards a:
- trade designated occupation ______________________
- post-secondary program ______________________

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 4:

MAKING CONNECTIONS IN CTS

August 1997 (Interim)

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Purpose

This document has been designed to assist teachers and school administrators to

- ***identify connections among the 22 CTS strands, as well as with other areas of the curriculum***
- ***understand how these connections provide opportunities to enhance student learning***
- ***review sample strategies that can be used to help students make connections in their learning.***

The linkages identified in this document are by no means complete. There are many ways to reinforce, relate, extend and apply learning across the CTS curriculum. Building connections depends on taking advantage of opportunities to relate the needs and interests of students to current learning processes and future learning challenges.

Further suggestions regarding ways to make connections in CTS would be welcome.

CTS Team
August, 1997

Questions or comments about this Manual for Administrators, Counsellors and Teachers are welcomed and should be directed to:

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education,
Devonian Building West, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.
Telephone: 403–422–4872*, Fax: 403–422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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C. Sample Integrated Projects 59

A. Making Connections in CTS

There are many opportunities to build connections within CTS - among CTS strands and across other subject areas, including core and complementary programs.

In addition to making "horizontal" linkages across the curriculum, making connections "vertically" between what the student has already learned (e.g., elementary to junior high, junior high to senior high) and future learnings (senior high to workplace or post-secondary programs) can enhance student learning.

Why Is It Important To Help Students Make Connections?

It is important to help student make connections, both within CTS and across the curriculum. In addition to offering a more efficient and effective way of delivering education to all students, making connections among different areas of learning will enable individual students to become flexible and lifelong learners.

When students make connections, they are able to:

- transfer and apply what they have learned to new learning situations
- recognize the similarity in the language and terms used in different disciplines
- be flexible in their learning styles as they link theory and practice
- identify and prepare for a range of career options.

Transfer and Application

Horizontal Connections: Students need to recognize that what they are learning in one subject can be transferred to other learning challenges. In making these transfers, students will be more confident and willing to try to master new learnings and accept new challenges.

Vertical Connections: When students recognize how prior learning builds the foundation for success in future learning, they can better target their efforts and are more likely to be motivated to build higher levels of competency. Recognition of prior learning also provides opportunities for students to expand their learning in particular contexts, or broaden their learning experiences by moving into other areas of learning.

Language and Terminology

Similarly, teachers may need to help students to overcome the "language barrier." Concepts presented in one course may use terminology that is specific to that subject area. The same concepts may be described differently in another subject area. Identifying connections will assist students in seeing the parallels, or, indeed, the differences between vocabulary/terminology used in a variety of core and complementary courses.

Learning Styles

Sometimes a student's preferred learning style makes it difficult for them to understand a concept when it is presented in an abstract (or theoretical) manner. When students become "hooked" or intrigued with the practical, they may be more able and interested in learning theory and relating it to practical experience. For example, a student who is successful in designing a building for a construction project may be more able to understand concepts taught in mathematics.

Career Planning

CTS provides students with opportunities to explore interests and develop knowledge, skills and attitudes that will help them to prepare for entry into a career. Students need to recognize how the competencies they develop transfer to many situations and support a wide range of career opportunities. Identifying and reinforcing the linkages between concepts included in CTS courses and those defined in other core and complementary programs will facilitate transitions into post-secondary and the workplace.

Building Connections Within CTS

With the flexible curriculum structure of CTS, schools are encouraged to help students access a wide range of modules from strands that will help them meet their career goals. Each strand provides opportunities for students to develop competencies that link with, or enhance what they will learn in other CTS strands. A chart that identifies linkages among the 22 strands of CTS is provided in Chart No. 1 on page 4.

The following are some ways in which the CTS curriculum supports and promotes connections in learning:

Strand "Families"

Throughout the development of CTS curriculum, every effort was made to eliminate unnecessary duplication of specific competencies across the strands. Competencies that were previously repeated in several programs were placed in a "home" strand. For example, welding skills that are included in the Fabrication Studies strand would likely also be taken by students focusing on the Mechanics strand.

CTS teachers need to be familiar with modules across a "family" of strands in order to identify modules that develop and enhance learnings in the strand(s) they are teaching. Teachers may choose to include module(s) from two or more strands in their courses, or to work with other teachers and share the delivery of the modules.

"Process" Strands

CTS strands that focus on developing basic "process" competencies are particularly suitable for combining with strands that are more specialized in context. For example, competencies developed in modules from Enterprise and Innovation, Design Studies, Information Processing and Management and Marketing can be effectively contextualized within other strands.

Assessment Practices

Where possible, assessment tools designed to help teachers judge student achievement are consistent across the CTS strands. This enables students taking modules from several strands to understand how the skills they develop in one strand can transfer to another strand. In addition, the assessment tools establish "benchmarks" for student performance, helping teachers across the province assess student achievement in a fair and consistent manner.

Basic Competencies

In addition to career-specific learnings defined within a module, all CTS modules integrate and reinforce basic competencies. These competencies, sometimes referred to as employability skills, are developed within each CTS module. For example, as students work on projects that develop career-specific competencies , they will also be expected to demonstrate teamwork, problem solving, ethics and safe work practices.

A checklist of the basic competencies developed throughout CTS is provided in the *Guide to Standards and Implementation* (see Section G: Assessment Tools) for each strand.

Integrating Concepts

A number of integrating concepts are reinforced across the CTS strands. Often these concepts are "housed" in one strand, but contextualized in other strands. Focusing attention on the integrating concepts as appropriate in each CTS module will heighten awareness of their significance in a variety of personal and work-related situations.

The following integrating concepts are identified and described in Chart No. 2 on page 6:

- career
- technology
- design
- enterprise
- environment
- family
- legislation
- safety
- service.

Chart No. 1:

Opportunities for Making Connections Within CTS

CTS Strands	Agriculture	Career Transitions	Communications Technology	Community Health	Construction Technology	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Agriculture	■	■	▤	■	■		■	▤	▤	▤	■		▤	▤	▤	▤	▤		▤	■		▤
Career Transitions	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Communication Technology	▤	■	■	▤				▤		▤		▤				▤			▤		▤	▤
Community Health	■	■	▤	■	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	■	▤	▤		▤	▤	▤	■
Construction Technologies	■	■		▤	■		■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤		▤	▤		
Cosmetology Studies		■		▤		■				▤		▤	▤			▤	▤		▤			
Design Studies	■	■		▤	■		■	▤		▤		■		▤		▤			▤	▤		
Electro-Technologies	▤	■	▤	▤	▤		▤	■	▤	▤	▤				▤	■			▤	■		▤
Energy and Mines	▤	■		■	▤			▤	■	▤	■				▤	▤	▤		▤	■		▤
Enterprise and Innovation	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤		■	▤	▤	▤
Fabrication Studies	■	■		▤	▤		▤	▤	■	▤	■		▤	▤	▤	▤	▤		▤	■		
Fashion Studies		■	▤	▤	▤	▤	■			▤		■	▤			▤	▤		■			
Financial Management	▤	■		▤	▤	▤				▤	▤	▤	■	▤		▤	▤		▤	▤		
Foods	▤	■		▤	▤		▤			▤	▤		▤	■		▤	▤		▤		▤	▤
Forestry	▤	■		■	▤			▤	▤	▤	▤				■	▤	▤		▤	▤	▤	■
Information Processing	▤	■	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤		■	▤	▤	▤
Legal Studies	▤	■		▤	▤	▤	▤		▤	▤	▤	▤	▤	▤	▤	▤	■		▤		▤	▤
Logistics	▤	■							▤	▤					▤	▤			▤			
Management and Marketing	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	■	▤	▤	▤	■	▤		■	▤	▤	▤
Mechanics	■	■		▤	▤		▤	■	■	▤	■		▤		■	▤			▤	■		
Tourism Studies		■	▤	▤						▤				▤	▤	▤	▤		▤		■	▤
Wildlife	▤	■	▤	■				▤	▤	▤				▤	■	▤	▤		▤		▤	■

■ Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.
▤ Provides some links with course content, usually through the application of related technologies and/or processes.

Chart No. 2:

Integrating Themes in CTS

CTS Strands

Integrating Concept	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technology	Cosmetology Studies	Design Studies	Electro Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Career	X	■	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Technology	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Design	X		X		X	X	■	X		X	X	X		X		X			X	X		
Enterprise	X			X		X				■		X	X	X			X				X	
Environment	■			X				X	■	X			X		■		X			X		■
Family				■		X						X	X	X			X					
Legislation	X			X				X	X				X		X		X			X		X
Safety	X	X	X	X	X	X	X	X	X					X	X		X			X		X
Service	X							X						X			X			X		

■ - primary emphasis on concept X - concept addressed within strand

Careers	provides opportunities for students to identify and assess a wide range of career options, both in their personal life and work life; students learn about career and occupational expectations and opportunities.
Technology:	focuses on the use of all levels of technology, from simple hand tools to sophisticated computer and telecommunications technologies; students learn to select and manage available technology to respond to challenges.
Design:	presents the concept of design as a generic strategy that can be used across the CTS strands for resolving problems; resolution may be in two or three-dimensions and involve plans, systems, materials, etc.
Enterprise:	develops students' ability to identify and respond to challenges and opportunities in a creative way, and to manage response to change efficiently and effectively.
Environment:	addresses a variety of relevant environmental issues; focuses attention on citizen/worker empowerment; develops strategies for problem solving through goal setting, planning, negotiation and consensus building.
Family:	applies related concepts in contexts related to the individual's role in the family and the changing nature of the family as a support system and economic unit.
Legislation:	develops understanding of the processes used in establishing and changing laws; makes specific reference to laws and/or statutes and general reference to regulations, policies, standards that imply legislation.
Safety:	establishes expectations regarding safe and responsible behavior in situations that involve the use of tools, equipment, materials and facilities.
Service:	focuses attention on strategies for identifying and responding to client / customer needs in a proactive manner; addresses career options within the service sector.

Building Connections Across the Curriculum

CTS courses provide career-specific contexts through which students can reinforce, extend and apply cognitive, affective and psychomotor aptitudes and abilities developed in other core and complementary programs. Course planning may well involve the use of alternative learning modes that expand thinking processes and help students to make connections between abstract concepts and their application in practical settings. Chart No. 3 on page 8 identifies core and complementary program areas in junior and senior high school that support and link with each of the 22 CTS strands.

Concept Mapping Science and mathematics represent two core program areas where an understanding of particular core concepts and skills often needs to be developed prior to their application in practical CTS contexts. A horizontal mapping of concepts and skills in science and mathematics to CTS modules is provided in the *Guide to Standards and Implementation* (see Section H: Linkages and Transitions) for each CTS strand.

Application of Process CTS students will also refine and apply process skills developed in core courses. To support the application of process skills in CTS, generic frameworks have been developed for laboratory investigation, the research process, reports/presentations, issue analysis, and negotiation/debate. These frameworks parallel processes used in science, language arts and social studies, and can be used to guide students in their application of process in career-specific settings. The generic frameworks for process are provided in each *Guide to Standards and Implementation* (see Section G: Assessment Tools).

Vertical Integration Vertical integration implies the sequencing of instruction across subject areas so that particular concepts and skills are developed prior to their application and use in practical CTS settings. CTS teachers need to:

- use appropriate references to identify concepts/skills in core disciplines (e.g., mathematics, science) that may be reviewed prior to their use in CTS modules
- become aware of the possible need to teach particular core concepts/skills if they are going to be used in a CTS module prior to their development in a core discipline.
- identify prior learnings (prerequisites and corequisites) considered necessary for the successful completion of each CTS module as identified in the Guide to Standards and Implementation (Section D, E and F)

Chart No. 3:

Opportunities for Making Connections Across the Curriculum

CTS Strands	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Agriculture	▤	▤	■	■				▤	▤	■	■	■	■		▤		▤		
Career Transitions																			
Communication Technology	▤	▤					▤	▤	▤		▤						▤		
Community Health	▤	▤			■	▤		▤	▤		▤	■	▤		■	▤			
Construction Technologies	▤	▤	■	■	▤			▤	▤	■	■	▤	▤	▤	▤				
Cosmetology Studies																			
Design Studies				▤			■				▤			▤			■		
Electro-Technologies	▤		■	■			▤	▤		■	■			■	▤				
Energy and Mines	▤	▤	▤	■				▤	▤		■		■	■	▤				
Enterprise and Innovation	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Fabrication Studies	▤	▤	■	■	▤			▤	▤	■	■		▤	▤	▤				
Fashion Studies			▤	▤			▤		▤	▤							■	▤	
Financial Management	▤	▤	▤					▤		▤						▤			
Foods		▤	▤	▤	■				▤	▤	▤	▤	▤		▤	▤		▤	▤
Forestry	▤	▤	▤	■		▤		▤	▤	■	■	■			▤	▤			
Information Processing	■	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Legal Studies	▤	▤		▤				▤	▤		▤				▤				
Logistics		▤													▤			▤	▤
Management and Marketing	■	▤	▤	▤	▤			■	▤	▤	▤				▤		▤		
Mechanics	▤		■	▤				▤		▤	▤			▤					
Tourism Studies	▤	▤						▤	▤										▤
Wildlife	▤	▤	▤	■		■		▤	▤		■	■			▤	▤	▤	▤	

■ Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.

▤ Provides some links with course content, usually through the application of related technologies and/or processes.

How Can Teachers Promote Connections?

Teachers can foster and promote connections **directly** through projects and assignments that purposely link learnings from one discipline/subject to another, and **indirectly** by taking advantage of incidental opportunities that arise in the classroom to reinforce linkages with other curricular areas.

Building Networks: Collaboration and Sharing

Teachers have always developed lessons, activities and projects that help students make connections and link what they are learning in one class with what they are doing in another class. Through sharing ideas and successful projects, teachers can expand their library of ideas and materials.

Designing Courses

Teachers can work together to design courses that strengthen linkages, broaden students' scope of learning and better prepare them for a wide range of occupations. As well, cooperative course planning can expand opportunities for students to practice, extend and/or enhance competencies in a variety of contexts and with more challenging expectations. Sample courses that combine modules from different strands are provided in the *Guide to Standards and Implementation* for each CTS strand (see Section C: Program Planning).

Designing Integrated Projects

Projects can be designed that encourage students to integrate and apply learnings/resources from several different curricular areas. Sample projects that establish connections and integrate learning across CTS strands and/or with core and complementary programs have been provided in Section C (see page 59). Each sample project identifies relevant curricular areas, the steps involved in project planning, the targeted age/grade level, project parameters (including time, facility, equipment and resources) and contact(s) for further information.

Encouraging the Student to Take Action

The ability to make connections and transfer competencies among related areas of learning is a challenge students face in becoming self-directed and life long learners. It is valuable to share ideas / strategies on how to address the challenges students face when making connections and transferring their competencies to other contexts. It may be useful to encourage students to take time to reflect on and talk about what they have learned in CTS courses, and how it relates to other areas of learning.

Assessing Student Achievement

Wherever possible, teachers across the CTS strands should apply consistent standards of achievement for student performance. To assist in this challenge, teachers can use the assessment tools designed to help teachers judge whether or not a student has met the minimal standard of competency.

Using Curriculum Documents

This document will assist teachers and others involved in the planning of courses for CTS to identify some of the formal linkages that have already been identified by way of the CTS curriculum development process.

- ***CTS Documents***

Further information regarding connections within CTS and across the curriculum is provided in the *Guide to Standards and Implementation* (Section C: Program Planning; Section G: Assessment Tools; Section H: Linkages and Transitions) for each CTS strand. Teachers should recognize, however, that other linkages will evolve as emphases within particular courses are established.

- ***Other Curriculum Documents***

Becoming familiar with the content and processes developed in other core and complementary program areas will enable teachers to:

- maintain consistency in learning expectations and demands
- avoid instances of overlap or repetition between CTS and other core/complementary courses
- identify prior learnings (prerequisites and corequisites) necessary for success in CTS modules.

B. Identifying Connections in CTS Strands

This section provides a series of charts that identify opportunities to build connections within each of the 22 CTS strands. The charts identify opportunities for students to reinforce, relate, extend and/or apply competencies specific to each CTS strand and module to other:

- ***CTS strands, and***
- ***core and complementary program areas.***

The connections profiled throughout this section are not complete. Linkages identified within each chart provide only a starting point for further discussion, collaboration and sharing of ideas/resources among teachers.

Combining CTS Modules with Non-CTS Courses

The modular structure of CTS allows flexibility in developing course offerings where CTS modules are combined with non-CTS courses. While such combinations help students to make connections across the curriculum, care must be taken when planning combined courses to ensure they deliver all the prescribed learnings in both the CTS module and the non-CTS course, as well as preserve the student's right to access to instruction.

The following guidelines are intended to assist schools in planning and delivering instructional programs where CTS modules are combined with non-CTS courses:

- a written description for the combined module/course should be provided for students and/or parents
- students should have the option to take the non-CTS course with or without the integrated CTS module(s)
- the combined course should provide an appropriate level of challenge and enhance career planning
- students shall have access to at least 25 hours of instruction per high school credit for any combined course offering 4 or more credits; students shall have access to at least 62.5 hours of instruction for a combined course offering 3 credits
- adequate resources should be available to support the delivery of a combined course (e.g., facilities, equipment, learning and teaching resources, instructional expertise)
- students shall successfully meet the evaluation criteria outlined for both the CTS module(s) and non-CTS course; the CTS module(s) and non-CTS course shall be graded and reported separately
- if the module expectations are the same as some of the course expectations, then either the CTS module or non-CTS course shall carry credit; a combined course may not offer double credits for the same learnings.

> Further information regarding policies that govern the planning of courses delivered by flexible and innovative methods other than standard classroom timetabling is provided in the *Guide to Education: ECS to Grade 12 Handbook* (see Section B: Program Planning).

Agriculture: Connections with Other CTS Strands

	Other CTS Strands																				
Agriculture Modules	Career Transitions	Communication Technology	Community Health	Construction Technology	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Social and Cultural Perspectives																					
AGR1010: Agriculture: The Big Picture	▤												▤		▤						
AGR2020: Animal Husbandry/Welfare	▤			▤		▤			▤	▤					▤	▤					
AGR3010: Issues in Agriculture	▤							▤					▤		▤					▤	▤
Theme: Technology and Applications																					
AGR1030: Production Basics	▤								▤			▤	▤	▤							
AGR1060: Consumer Products & Services	▤								▤			▤	▤								
AGR1070: Basic Landscape/Turf Care	▤		▤	■		▤			▤	▤		■						▤	■		
AGR1080: Basic Floral Design	▤					■			▤			■						▤			
AGR1090: Market Fundamentals	▤								▤			▤			▤			■			
AGR1100: Agriculture Technology	▤	▤		▤		▤	▤			■									■		
AGR2030: Field Crops 1	▤		■	■			▤		▤	■		■		■				▤	■		
AGR2040: Livestock/Poultry 1	▤		■	■			▤		▤	■		■						▤	■		
AGR2050: Agrifoods 1	▤								▤			▤	■					▤			
AGR2060: Landscape/Turf Management 1	▤		▤	■		▤			▤	▤		■						▤	■		
AGR2070: Equine 1	▤		▤	▤			▤		▤	▤		▤						▤			
AGR2080: Floral Design 1	▤					■			▤			■						▤			
AGR2090: Marketing 1	▤								▤			▤			▤			■			
AGR2100: Protected Structures	▤			▤			▤		▤	▤				▤							
AGR2140: Nursery/Greenhouse Crops 1	▤		■	■			▤		▤	■		■		■				▤	■		
AGR3030: Field Crops 2	▤		■	■			▤		▤	■		■		■				▤	■		
AGR3040: Livestock/Poultry 2	▤		■	■			▤		▤	■		■						▤	■		
AGR3050: Agrifoods 2	▤								▤			▤	■					▤			
AGR3060: Landscape/Turf Management 2	▤		▤	■		▤			▤	▤		■						▤	■		
AGR3070: Equine 2	▤		▤	▤			▤		▤	▤		▤						▤			
AGR3080: Floral Design 2	▤					■			▤			■						▤			
AGR3090: Marketing 2	▤								▤			▤			▤			■			
AGR3100: Biotechnology	▤								▤				▤	▤							
AGR3140: Nursery/Greenhouse Crops 2	▤		■	■			▤		▤	■		■		■				▤	■		
Theme: Management and Conservation																					
AGR1110: Resource Management	▤							■						▤	▤	▤				■	■
AGR2120: Soils Management 1	▤							▤						■							▤
AGR213: Integrated Pest Management	▤		▤						▤					▤							▤
AGR3110: Water Management	▤							▤						▤		▤					▤
AGR3120: Soils Management 2	▤							▤						■							▤
AGR3130: Sustainable Agriculture Systems	▤							■						▤	▤	▤				■	■

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Agriculture: Connections Across the Curriculum

Across the Curriculum

Agriculture Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Social and Cultural Perspectives																			
AGR1010: Agriculture: The Big Picture	▤	▤						▤	▤						▤				
AGR2020: Animal Husbandry/Welfare	▤	▤		▤				▤	▤			▤	▤						
AGR3010: Issues in Agriculture	▤	■		▤				▤	■		■							▤	
Theme: Technology and Applications																			
AGR1030: Production Basics			▤	■						▤			▤						
AGR1060: Consumer Products & Services				■															
AGR1070: Basic Landscape/Turf Care			▤	■							▤	■	▤		▤				
AGR1080: Basic Floral Design			▤	▤			▤				▤	▤			▤		▤		
AGR1090: Market Fundamentals	▤	▤							▤										
AGR1100: Agriculture Technology		▤	▤	■						▤		▤	▤						
AGR2030: Field Crops 1			▤	■							▤	■	▤		▤				
AGR2040: Livestock/Poultry 1			▤	■							▤	■	▤		▤				
AGR2050: Agrifoods 1			▤	■							▤	■	▤		▤				
AGR2060: Landscape/Turf Management 1			▤	■							▤	■	▤		▤				
AGR2070: Equine 1			▤	■							▤	■			▤				
AGR2080: Floral Design 1											▤	▤	▤		▤		▤		
AGR2090: Marketing 1		▤	▤						▤						▤				
AGR2100: Protected Structures			▤	■						▤	▤	▤	▤						
AGR2140: Nursery/Greenhouse Crops 1			▤	■							▤	■	▤		▤				
AGR3030: Field Crops 2			▤	■							▤	■	▤		▤				
AGR3040: Livestock/Poultry 2			▤	■							▤	■	▤		▤				
AGR3050: Agrifoods 2			▤	■							▤	■	▤		▤				
AGR3060: Landscape/Turf Management 2			▤	■							▤	■	▤		▤				
AGR3070: Equine 2			▤	■							▤	■			▤				
AGR3080: Floral Design 2											▤	▤	▤		▤		▤		
AGR3090: Marketing 2		▤	▤						▤						▤				
AGR3100: Biotechnology				■							■	■	▤	▤					
AGR3140: Nursery/Greenhouse Crops 2			▤	■							▤	■	▤		▤				
Theme: Management and Conservation																			
AGR1110: Resource Management	▤	▤		■				▤	▤		■	▤							
AGR2120: Soils Management 1				▤							▤	▤	■						
AGR2130: Integrated Pest Management			▤	■							■	■	■						
AGR3110: Water Management	▤			■				▤			▤								
AGR3120: Soils Management 2				▤							▤	▤	■						
AGR3130: Sustainable Agriculture Systems	▤	▤		■				▤	▤		■							▤	

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.	■
Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Career Transitions: Connections with Other CTS Strands

	Other CTS Strands																				
Career Transitions Modules	Agriculture	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Career Readiness																					
CTR1010: Job Preparation	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
CTR2010: Job Maintenance	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
CTR3010: Preparing for Change	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Theme: Career Extensions																					
CTR1110: Project 1A	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR1120: Project 1B	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2110: Project 2A	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2120: Project 2B	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2130: Project 2C	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2140: Project 2D	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2150: Project 2E	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3110: Project 3A	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3120: Project 3B	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3130: Project 3C	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3140: Project 3D	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3150: Project 3E	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Career Credentials																					
CTR3040: Practicum 3A	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3050: Practicum 3B	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3060: Practicum 3C	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3070: Practicum 3D	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3080: Practicum 3E	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Leadership																					
CTR1020: Leading by Example	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2020: Taking the Lead	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2030: Governance & Leadership	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3020: Organizational Leadership	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3030: Leading for Change	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Job Safety Skills																					
CTR1210: Personal Safety (Management)	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR2210: Workplace Safety Practices	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
CTR3210: Safety Management Systems	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Career Transitions: Connections Across the Curriculum

Across the Curriculum

Career Transitions Modules	Junior High						Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Career Readiness																		
CTR1010: Job Preparation		▤			▤			▤						▤				
CTR2010: Job Maintenance		▤			▤			▤						▤				
CTR3010: Preparing for Change		▤			▤			▤						▤				
Theme: Career Extensions																		
CTR1110: Project 1A																		
CTR1120: Project 1B																		
CTR2110: Project 2A																		
CTR2120: Project 2B																		
CTR2130: Project 2C																		
CTR2140: Project 2D																		
CTR2150: Project 2E																		
CTR3110: Project 3A																		
CTR3120: Project 3B																		
CTR3130: Project 3C																		
CTR3140: Project 3D																		
CTR3150: Project 3E																		
Theme: Career Credentials																		
CTR3040: Practicum 3A																		
CTR3050: Practicum 3B																		
CTR3060: Practicum 3C																		
CTR3070: Practicum 3D																		
CTR3080: Practicum 3E																		
Theme: Leadership																		
CTR1020: Leading by Example		▤			▤	▤		▤						▤	▤			
CTR2020: Taking the Lead		▤			▤	▤		▤						▤	▤			
CTR2030: Governance & Leadership		▤			▤			▤						▤	▤			
CTR3020: Organizational Leadership		▤			▤	▤		▤						▤	▤			
CTR3030: Leading for Change		▤			▤			▤						▤	▤			
Theme: Job Safety Skills																		
CTR1210: Personal Safety (Management)				▤	▤	▤				▤				▤				
CTR2210: Workplace Safety Practices				▤	▤	▤				▤				▤				
CTR3210: Safety Management Systems				▤	▤	▤				▤				▤				

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Communication Technology: Connections with Other CTS Strands

Communication Technology Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Enterprise and Innovation	Electro-Technologies	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Presentation																					
COM1010: Presentation & Communication 1		▤				▤		▤							▤			▤			
COM1020: Media & You																					
COM2010: Presentation & Communication 2		▤				▤		▤							▤			▤			
COM2020: Media Design & Analysis 1																		▤			
COM2030: Script Writing 1																					
COM3010: Presentation & Communication 3		▤				▤		▤							▤			▤			
COM3020: Media Design & Analysis 2																		▤			
COM3030: Script Writing 2																					
Theme: Photography																					
COM1030: Photography 1						■												▤			
COM2040: Photography 2						■									▤			▤			
COM2050: Photographic Communication						▤												▤			
COM2060: Photographic Techniques 1						■									▤			▤			
COM2130: Special Effects Photography																					
COM3040: Photography 3						■									▤			▤			
COM3050: Photojournalism																					
COM3060: Photographic Techniques 2						■									▤			▤			
COM3070: Colour Photography						▤															
Theme: Print																					
COM1050: Printing 1						■												▤			
COM2070: Printing Techniques 1						■												▤			
COM2080: Printing Applications 1						■									▤			▤			
COM3080: Printing Techniques 2						■												▤			
COM3090: Printing Applications 2						■									▤			▤			
Theme: Audio/Video																					
COM1060: Audio/Video Production 1						▤									▤			▤			
COM1070: Animation 1															▤						
COM1080: Digital Design 1						■									■			▤			
COM2090: Audio/Video 1						▤									▤			▤			
COM2100: Audio/Video 2						▤									▤			▤			
COM2110: Animation 2															■						
COM2120: Digital Design 2						■									■			▤			
COM3100: Audio 3						▤												▤			
COM3110: Video 3						▤												▤			
COM3120: Animation 3															■						
COM3130: Digital Design 3						■									■			▤			

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Communication Technology: Connections Across the Curriculum

	Junior High							Senior High											
Communication Technology Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Presentation																			
COM1010: Presentation & Communication 1	▤							▤											
COM1020: Media & You							▤										▤		
COM2010: Presentation & Communication 2								▤											
COM2020: Media Design & Analysis 1								▤											
COM2030: Script Writing 1								■											
COM3010: Presentation & Communication 3								▤											
COM3020: Media Design & Analysis 2								▤											
COM3030: Script Writing 2								■											
Theme: Photography																			
COM1030: Photography 1				▤			▤				▤		▤	▤			▤		
COM2040: Photography 2											▤		▤	▤			▤		
COM2050: Photographic Communication	▤							▤									▤		
COM2060: Photographic Techniques 2																	▤		
COM2130: Special Effects Photography							▤												
COM3040: Photography 3											▤			▤	▤		▤		
COM3050: Photojournalism																			
COM3060: Photographic Techniques 2																	▤		
COM3070: Colour Photography											▤			▤	▤		▤		
Theme: Print																			
COM1050: Printing 1							▤										▤		
COM2070: Printing Techniques 1																	▤		
COM2080: Printing Applications 1																	▤		
COM3080: Printing Techniques 2																	▤		
COM3090: Printing Applications 2																	▤		
Theme: Audio/Video																			
COM1060: Audio/Video Production 1	▤	▤						▤	▤								▤		
COM1070: Animation 1							▤										▤		
COM2090: Audio/Video 1																	▤		
COM2100: Audio/Video 2																	▤		
COM2110: Animation 2																	▤		
COM2120: Digital Design 2																	▤		
COM3100: Audio 3																	▤		
COM3110: Video 3																	▤		
COM3120: Animation 3																	▤		
COM3130: Digital Design 3																	▤		

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Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Community Health: Connections with Other CTS Strands

	Other CTS Strands																				
Community Health Modules	Agriculture	Career Transitions	Communication Technology	Construction Technology	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Socio-Cultural Perspectives																					
CMH1010: Family Dynamics		▤										▤			▤	▤					
CMH2010: Adolescent Health Issues		▤	▤						▤						▤						
CMH2020: Perspectives on Marriage		▤	▤									▤			▤	▤					
CMH2030: Community Volunteerism	■	▤	■	■	■	■	■	■	■	■		■	■	■	■			■	■	■	■
CMH3010: Family Issues		▤	▤				▤								▤	▤					
CMH3020: Parenting		▤										▤			▤						
CMH3030: Aging		▤				▤	▤		▤		▤		▤		▤	▤					
Theme: Skills for Caring																					
CMH1040: Caring for Children		▤				▤			▤		▤	▤	▤								
CMH1050: Child Development		▤				▤					▤		▤		▤						
CMH1060: Home Care 1		▤			▤	▤									▤						
CMH2050: Day Care 1		▤											▤			▤					
CMH2060: Home Care 2 (Personal Care Services)		▤											▤		▤						
CMH2070: Sensory Challenges		▤																			
CMH3040: Prenatal & Postnatal Care		▤													▤						
CMH3050: Day Care 2		▤											▤								
CMH3060: Home Care 3 (Special Conditions)		▤													▤						
CMH3070: Challenged Individuals		▤				▤					▤				▤						
Theme: Health Sciences																					
CMH1080: Perspectives on Health		▤							▤						▤	▤				▤	
CMH2080: Respiratory System		▤																			
CMH2090: Circulatory System		▤																			
CMH2100: Musculoskeletal System		▤																			
CMH2110: Complementary Therapies		▤																			
CMH3080: Digestive System		▤																			
CMH3090: Nervous/Endocrine Systems		▤																			
CMH3100: Mental Health		▤																			
CMH3110: Advances in Medical Technology							▤														
Theme: Injury Prevention																					
CTR1210: Personal Safety (Management)	▤	■						■						■							■
CMH2120: First Aid/CPR	■	▤						■						■							■
CMH2130: Sports First Aid 1		▤																			
CMH3120: First Aid/CPR for Children		▤																			
CMH3130: Sports First Aid 2		▤																			

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Community Health: Connections Across the Curriculum

Across the Curriculum

Community Health Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Socio-Cultural Perspectives																			
CMH1010: Family Dynamics	▤	▤			▤			▤	▤						■			▤	
CMH2010: Adolescent Health Issues	▤	▤		■	■	▤		▤			■	■			▤				
CMH2020: Perspectives on Marriage								▤	▤						■	▤			
CMH2030: Community Volunteerism	▤	▤			▤			▤	▤		▤				▤	▤		▤	▤
CMH3010: Family Issues								▤	▤						■			▤	
CMH3020: Parenting								▤	▤										
CMH3030: Aging								▤	▤		▤	▤			■			▤	
Theme: Skills for Caring																			
CMH1040: Caring for Children	▤							▤	▤		▤				▤			▤	
CMH1050: Child Development	▤										▤				▤				
CMH1060: Home Care 1	▤							▤	▤			▤							
CMH2050: Day Care 1								▤											
CMH2060: Home Care 2 (Personal Care Services)								▤			▤	▤						▤	
CMH2070: Sensory Challenges	▤											▤							
CMH3040: Prenatal & Postnatal Care								▤				▤							
CMH3050: Day Care 2								▤			▤	▤							
CMH3060: Home Care 3 (Special Conditions)								▤			▤	▤						▤	
CMH3070: Challenged Individuals								▤				▤			■				
Theme: Health Sciences																			
CMH1080: Perspectives on Health					▤			▤			▤	■							
CMH2080: Respiratory System								▤			■	■	▤			▤			
CMH2090: Circulatory System								▤			■	■	▤			▤			
CMH2100: Musculoskeletal System								▤			■	■	▤			▤			
CMH2110: Complementary Therapies								▤			■	■	▤						
CMH3080: Digestive System								▤			■	■	▤						
CMH3090: Nervous/Endocrine System								▤			■	■	▤					▤	
CMH3100: Mental Health								▤											
CMH3110: Advances in Medical Technology								▤			▤	▤							
Theme: Injury Prevention																			
CTR1210: Personal Safety (Management)					▤	▤		▤								▤			
CMH2120: First Aid/CPR								▤			▤					▤			
CMH2130: Sports First Aid 1								▤				▤				▤			
CMH3120: First Aid/CPR for Children								▤				▤				▤			
CMH3130: Sports First Aid 2								▤				▤				▤			

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Construction Technologies: Connections with Other CTS Strands

Construction Technologies Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Building Systems (Processes and Applications)																					
CON1010: Basic Tools & Materials		▤				▤				■				▤					▤		
CON1070: Building Construction	▤	▤					▤														
CON2010: Site Preparation	▤	▤																			
CON2020: Concrete Forming		▤																			
CON2030: Alternative Foundations		▤																			
CON2040: Framing Systems 1 (Floor &Wall)		▤																			
CON2050: Roof Structures 1 (Framing and Finishing)		▤																			
CON2060: Exterior Finishing (Door, Window & Siding)		▤																			
CON2070: Electrical Systems		▤					■														
CON2080: Plumbing Systems		▤																			
CON2090: Climate Control Systems	■	▤																			
CON2100: Agri-structures	■	▤																			
CON3010: Concrete Work (Structures & Finishes)		▤																			
CON3020: Masonry Work (Structures & Finishes)		▤																			
CON3030: Wall & Ceiling Finishing		▤																			
CON3040: Stair Construction		▤																			
CON3050: Roof Structures 2 (Framing & Covering)		▤																			
CON3060: Doors & Trim		▤																			
CON3070: Floorcovering		▤																			
CON3080: Energy-efficient Housing		▤				▤		▤													
CON3090: Renovations/Restorations		▤																			
CON3100: Commercial Structures		▤																			
CON3110: Site Management		▤																			
Theme: Manufacturing Systems (Processes and Applications)																					
CON1120: Project Management		▤				■						▤									
CON1130: Solid Stock Construction		▤				▤								▤							
CON1140: Turning Operations		▤				▤															
CON1160: Manufactured Materials		▤				▤								▤							
CON1180: Mold Making & Casting		▤				▤															
CON2120: Multiple Materials		▤				▤															
CON2130: Furniture Making 1 (Box Construction)		▤				▤															
CON2140: Furniture Making 2 (Frame & Panel)		▤				▤															
CON2150: Finishing & Refinishing		▤				▤															
CON2160: Cabinetmaking 1 (Web & Face Frame)		▤				▤															
CON2170: Cabinetmaking 2 (Door & Drawer)		▤				▤															
CON2180: Wood Forming		▤				▤															
CON2190: Manufacturing Systems		▤																			
CON2200: Product Development		▤				■															
CON3120: Tool Maintenance		▤					▤												▤		
CON3130: Furniture Making 3 (Leg & Rail)		▤				▤															
CON3140: Furniture Making 4 (Surface Enhancement)		▤				▤															
CON3150: Furniture Repair		▤				▤															
CON3160: Cabinetmaking 3 (Cabinets/Countertops)		▤																			
CON3170: Cabinetmaking 4 (Layout & Installation)		▤				▤															
CON3190: Production Planning		▤								▤									▤		
CON3200: Production Management		▤								▤									▤		
CON3210: Framing Systems 2 (Floor, Wall & Ceiling)		▤																			

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Construction Technologies: Connections Across the Curriculum

Across the Curriculum

Construction Technologies Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Building Systems (Processes and Applications)																			
CON1010: Basic Tools & Materials				▤											▤				
CON1070: Building Construction			▤	▤											▤				
CON2010: Site Preparation										▤					▤				
CON2020: Concrete Forming															▤				
CON2030: Alternative Foundations													▤		▤				
CON2040: Framing Systems 1 (Floor & Wall)										▤					▤				
CON2050: Roof Structures 1 (Framing & Finishing)															▤				
CON2060: Exterior Finishing (Door, Window & Siding)															▤				
CON2070: Electrical Systems										▤	▤			▤	▤				
CON2080: Plumbing Systems										▤	▤			▤	▤				
CON2090: Climate Control Systems										▤	▤			▤	▤				
CON2100: Agri-structures															▤				
CON3010: Concrete Work (Structures & Finishes)															▤				
CON3020: Masonry Work (Structures & Finishes)															▤				
CON3030: Wall & Ceiling Finishing															▤				
CON3040: Stair Construction										▤					▤				
CON3050: Roof Structures 2 (Framing & Covering)										▤					▤				
CON3060: Doors & Trim															▤				
CON3070: Floorcovering															▤				
CON3080: Energy-efficient Housing											▤			▤	▤				
CON3090: Renovations/Restorations															▤				
CON3100: Commercial Structures															▤				
CON3110: Site Management															▤				
Theme: Manufacturing Systems (Processes and Applications)																			
CON1120: Project Management			▤												▤				
CON1130: Solid Stock Construction															▤				
CON1140: Turning Operations															▤				
CON1160: Manufactured Materials															▤				
CON1180: Mold Making & Casting															▤				
CON2120: Multiple Materials															▤				
CON2130: Furniture Making 1 (Box Construction)															▤				
CON2140: Furniture Making 2 (Frame & Panel)															▤				
CON2150: Finishing & Refinishing													▤		▤				
CON2160: Cabinetmaking 1 (Web & Face Frame)															▤				
CON2170: Cabinetmaking 2 (Door & Drawer)															▤				
CON2180: Wood Forming															▤				
CON2190: Manufacturing Systems								▤	▤						▤				
CON2200: Product Development															▤				
CON3120: Tool Maintenance															▤				
CON3130: Furniture Making 3 (Leg & Rail)															▤				
CON3140: Furniture Making 4 (Surface Enhancement)															▤				
CON3150: Furniture Repair															▤		▤		
CON3160: Cabinetmaking 3 (Cabinets/Countertops)															▤				
CON3170: Cabinetmaking 4 (Layout & Installation)															▤				
CON3190: Production Planning															▤				
CON3200: Production Management															▤				
CON3210: Framing Systems 2 (Floor, Wall & Ceiling)										▤					▤				

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.	■
Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Cosmetology Studies: Connections with Other CTS Strands

	Other CTS Strands																				
Cosmetology Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Images and Practices																					
COS1010: Personal Images		■		▤		▤												▤			
COS3010: Professional Practices		■																▤			
Theme: Hair and Scalp Care																					
COS1020: Hair Graphics 1		■				▤															
COS1030: Hair & Scalp Care 1		■																			
COS1040: Forming & Finishing 1		■				▤															
COS2010: Hair Graphics 2		■				▤															
COS2020: Hair & Scalp Care 2		■																			
COS2030: Forming & Finishing 2		■				▤															
COS3020: Long Hair Graphics		■				▤															
COS3030: Hair & Scalp Care 3		■																			
COS3040: Hair & Scalp Care 4 (Client Services)		■																			
Theme: Haircutting																					
COS2040: Haircutting 1		■				■															
COS2050: Hair Care & Cutting 1 (Client Services)		■																			
COS3050: Haircutting 2		■				▤															
COS3060: Haircutting 3 (Client Services)		■				▤															
COS3070: Hair Care & Cutting 2 (Client Services)		■																			
Theme: Chemical Services: Permanent Waving																					
COS1050: Permanent Waving 1 (The Physical Process)		■																			
COS2060: Permanent Waving 2 (Cold Waving)		■																			
COS2070: Permanent Waving 3 (Heat-assisted)		■																			
COS2080: Permanent Waving 4 (Client Services)		■																			
COS3080: Permanent Waving 5 (Designer)		■																			
COS3090: Relax/Straighten Hair		■				▤															
COS3100: Wave, Relax & Straighten Hair (Client Services)		■																			
Theme: Chemical Services: Haircolouring																					
COS2090: Colouring 1		■																			
COS2100: Colour Removal 1		■																			
COS2110: Colouring & Removal 1 (Client Services)		■																			
COS3110: Colouring 2 (Permanent)		■																			
COS3120: Colour Removal 2		■																			
COS3130: Colouring & Removal 2 (Client Services)		■																			

Provides many direct links with content in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Cosmetology Studies: Connections with Other CTS Strands (continued)

	Other CTS Strands																				
Cosmetology Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Skin Care																					
COS1060: Skin Care 1 (Basic Practices)		■																			
COS2120: Facials & Makeup 1		■																			
COS2130: Facials & Makeup 2 (Client Services)		■																			
COS2140: Skin Care 2 (Client Services)		■																			
COS3140: Body Therapy		■																			
COS3150: Hair Removal		■																			
COS3160: Skin Care 3 (Client Services)		■																			
Theme: Male Facial Grooming																					
COS3170: Male Facial Grooming 1		■																			
COS3180: Male Facial Grooming 2 (Client Services)		■																			
Theme: Nail Care																					
COS1070: Manicuring 1		■																			
COS2150: Manicuring 2		■																			
COS2160: Nail Art		■																			
COS2170: Manicuring 3 (Client Services)		■																			
COS3190: Nail Technology		■																			
COS3200: Pedicuring		■																			
COS3210: Nail Care (Client Services)		■																			
Theme: Special Effects/Services																					
COS1080: Theatrical Makeup 1 (Basic Principles)		■				■															
COS2180: Hairpieces & Extensions		■				▤															
COS2190: Theatrical Makeup 2 (Planning the Images)		■				▤															
COS3220: Wigs & Toupees		■																			
COS3230: Hair Goods (Client Services)		■																			
COS3240: Theatrical Makeup 3 (Changing Images)		■																			
COS3250: Theatrical Makeup 4 (Client Services)		■																			
COS3260: Facial & Body Adornment		■																			
Theme: Enterprise and Competition																					
COS2200: Historical Cosmetology		■				▤															
COS2210: Sales & Service 1 (Principles & Practices)		■																▤			
COS3270: Creative Cosmetology		■																			
COS3280: Sales & Service 2 (Effectiveness)		■																▤			
COS3290: Competition Cosmetology		■																			

Provides many direct links with content in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations. ■

Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Cosmetology Studies: Connections Across the Curriculum

Across the Curriculum

	Junior High							Senior High											
Cosmetology Studies Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Images and Practices																			
COS1010: Personal Images		▤			■										■			▤	
COS3010: Professional Practices		▤			■										■			▤	
Theme: Hair and Scalp Care																			
COS1020: Hair Graphics 1																			
COS1030: Hair & Scalp Care 1					▤														
COS1040: Forming & Finishing 1																			
COS2010: Hair Graphics 2																			
COS2020: Hair & Scalp Care 2					▤														
COS2030: Forming & Finishing 2																			
COS3020: Long Hair Graphics																			
COS3030: Hair & Scalp Care 3					▤														
COS3040: Hair & Scalp Care 4 (Client Services)																			
Theme: Haircutting																			
COS2040: Haircutting 1					▤														
COS2050: Hair Care & Cutting 1 (Client Services)																			
COS3050: Haircutting 2																			
COS3060: Haircutting 3 (Client Services)																			
COS3070: Hair Care & Cutting 2 (Client Services)																			
Theme: Chemical Services: Permanent Waving																			
COS1050: Permanent Waving 1 (The Physical Process)																			
COS2060: Permanent Waving 2 (Cold Waving)				▤									▤						
COS2070: Permanent Waving 3 (Heat-assisted)																			
COS2080: Permanent Waving 4 (Client Services)																			
COS3080: Permanent Waving 5 (Designer)				▤									▤						
COS3090: Relax/Straighten Hair				▤									▤						
COS3100: Wave, Relax & Straighten Hair (Client Services)																			
Theme: Chemical Services: Haircolouring																			
COS2090: Colouring 1				▤	▤								▤						
COS2100: Colour Removal 1				▤									▤						
COS2110: Colouring & Removal 1 (Client Services)																			
COS3110: Colouring 2 (Permanent)				▤									▤						
COS3120: Colour Removal 2				▤									▤						
COS3130: Colouring & Removal 2 (Client Services)																			

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.	■
Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Cosmetology Studies: Connections Across the Curriculum (continued)

Across the Curriculum

Cosmetology Studies Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Skin Care																			
COS1060: Skin Care 1 (Basic Practices)					■							▤							
COS2120: Facials & Makeup 1				▤	▤														
COS2130: Facials & Makeup 2 (Client Services)																			
COS2140: Skin Care 2 (Client Services)																			
COS3140: Body Therapy				▤	▤							▤							
COS3150: Hair Removal				▤								▤							
COS3160: Skin Care 3 (Client Services)																			
Theme: Male Facial Grooming																			
COS3170: Male Facial Grooming 1					▤														
COS3180: Male Facial Grooming 2 (Client Services)																			
Theme: Nail Care																			
COS1070: Manicuring 1					▤														
COS2150: Manicuring 2																			
COS2160: Nail Art																			
COS2170: Manicuring 3 (Client Services)																			
COS3190: Nail Technology					▤														
COS3200: Pedicuring																			
COS3210: Nail Care (Client Services)																			
Theme: Special Effects/Services																			
COS1080: Theatrical Makeup 1 (Basic Principles)																			
COS2180: Hairpieces & Extensions																			
COS2190: Theatrical Makeup 2 (Planning the Images)				▤															
COS3220: Wigs & Toupees																			
COS3230: Hair Goods Client Services)																			
COS3240: Theatrical Makeup 3 (Changing Images)				▤															
COS3250: Theatrical Makeup 4 (Client Services)																			
COS3260: Facial & Body Adornment		▤		▤	▤							▤						▤	
Theme: Enterprise & Competition																			
COS2200: Historical Cosmetology		▤			▤													▤	
COS2210: Sales & Service 1 (Principles & Practices)		▤			▤													▤	
COS3270: Creative Cosmetology																			
COS3280: Sales & Service 2 (Effectiveness)		▤																▤	
COS3290: Competition Cosmetology																			

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Provides some links with course content, usually through the application of related technologies and/or processes. ▤

Design Studies: Connections with Other CTS Strands

Design Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Design Skills, Processes and Applications																					
DES1010: Sketch, Draw & Model			▤	▤	▤	▤				▤	▤							▤			
DES1020: The Design Process			■		■	▤			■	■	■		▤					▤			
DES1030: 2-D Design Fundamentals			■								▤				▤						
DES1040: 3-D Design Fundamentals					▤					▤											
DES2010: 2-D Design Applications			■												▤			▤			
DES2020: 3-D Design Applications			▤		▤					▤	▤		▤						▤		
DES3010: 2-D Design Studio 1			■												▤			▤			
DES3020: 2-D Design Studio 2			■												▤			▤			
DES3030: 2-D Design Studio 3			■												▤			▤			
DES3040: 3-D Design Studio 1			▤		▤					▤	▤		▤					▤			
DES3050: 3-D Design Studio 2			▤		▤					▤	▤		▤					▤			
DES3060: 3-D Design Studio 3			▤		▤					▤	▤		▤					▤			
DES3070: Living Environment Studio 1					▤						▤										
DES3080: Living Environment Studio 2					▤						▤										
DES3090: Living Environment Studio 3					▤						▤										
Theme: Drafting for Design & Technical Drawing Skills																					
DES1050: CAD Fundamentals					▤		▤			▤	■										
DES1060: Drafting/Design Fund			▤		▤		▤			▤	▤										
DES2030: CAD Applications					▤		▤			▤	■										
DES2040: Drafting/Design Applications					▤		▤			▤	▤										
DES2050: Technical Drawing Applications					▤		▤			▤											
DES3100: CAD Modelling Studio					▤		▤			▤											
DES3110: Drafting/Design Studio 1					▤		▤			▤											
DES3120: Drafting/Design Studio 2					▤		▤			▤											
DES3130: Drafting/Design Studio 3					▤					▤											
DES3140: Technical Drawing Studio 1					▤					▤											
DES3150: Technical Drawing Studio 2					▤					▤											
DES3160: Technical Drawing Studio 3					▤					▤											
Theme: Business/Issues/History																					
DES2060: The Evolution of Design			▤		▤	▤	▤			▤	▤							▤			
DES3170: Visualizing the Future			▤		▤	▤	▤			▤	▤							▤			
DES3180: The Design Profession			▤						▤		▤										
DES3190: Portfolio Presentation	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤		▤	▤	▤	▤

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations. ■

Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Design Studies: Connections Across the Curriculum

Across the Curriculum

	Junior High							Senior High										
Design Studies Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences
Theme: Design Skills, Processes and Applications																		
DES1010: Sketch, Draw & Model							■										■	
DES1020: The Design Process				■			■				■			▤			■	
DES1030: 2-D Design Fundamentals							■										■	
DES1040: 3-D Design Fundamentals				▤			▤										▤	
DES2010: 2-D Design Applications							▤										▤	
DES2020: 3-D Design Applications				▤													▤	
DES3010: 2-D Design Studio 1																	▤	
DES3020: 2-D Design Studio 2																	▤	▤
DES3030: 2-D Design Studio 3																	▤	
DES3040: 3-D Design Studio 1																	▤	
DES3050: 3-D Design Studio 2																	▤	▤
DES3060: 3-D Design Studio 3														▤			▤	
DES3070: Living Environment Studio 1												▤		▤				▤
DES3080: Living Environment Studio 2														▤				
DES3090: Living Environment Studio 3														▤				
Theme: Drafting for Design & Technical Drawing Skills																		
DES1050: CAD Fundamentals																		
DES1060: Drafting/Design Fund.																		
DES2030: CAD Applications																		
DES2040: Drafting/Design Applications																		
DES2050: Technical Drawing Applications																		
DES3100: CAD Modelling Studio																		
DES3110: Drafting/Design Studio 1																		
DES3120: Drafting/Design Studio 2																		
DES3130: Drafting/Design Studio 3																		
DES3140: Technical Drawing Studio 1																		
DES3150: Technical Drawing Studio 2																		
DES3160: Technical Drawing Studio 3																		
Theme: Business/Issues/History																		
DES2060: The Evolution of Design							▤										■	
DES3170: Visualizing the Future							▤										■	
DES3180: The Design Profession																	▤	
DES3190: Portfolio Presentation							▤	▤									■	

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Provides some links with course content, usually through the application of related technologies and/or processes	▤

Electro-Technologies: Connections with Other CTS Strands

Electro-Technologies Modules	Other CTS Strands: Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Fabrication and Service Principles																					
ELT1010: Electro-assembly 1	▤	▤	▤				▤								▤				▤		
ELT2010: Electro-assembly 2		▤					▤		▤						▤				▤		
ELT2020: Electrical Servicing	▤	▤		▤				▤	▤										▤		
ELT3010: Electro-assembly 3		▤					▤		▤						▤				▤		
ELT3020: Electronic Servicing	▤	▤		▤				▤	▤										▤		
Theme: Power Systems																					
ELT1030: Conversion & Distribution		▤																	■		
ELT1050: Electronic Power Supply 1		▤					▤			▤					▤				▤		
ELT2030: Branch Circuit Wiring		▤		▤	■		▤		▤	▤					▤				▤		
ELT2050: Electronic Power Supply 2		▤					▤			▤					▤						
ELT3030: Power Systems & Services		▤					▤								▤				▤		
ELT3040: Generation/Transformation		▤																	▤		
Theme: Computer Logic Systems																					
ELT1060: Digital Technology 1		▤																	▤		
ELT1080: Control Systems 1	▤	▤																	■		
ELT2060: Digital Technology 2		▤	▤				▤												▤		
ELT2070: Computer Technology	▤	▤	▤												▤				▤		
ELT2080: Control Systems 2	▤	▤																	■		
ELT3060: Digital Technology 3		▤	▤																▤		
ELT3070: Digital Applications		▤																	▤		
ELT3080: Microprocessors	▤	▤	▤												■				▤		
ELT3090: Microprocessor Interface	▤	▤	▤				▤			▤					■				▤	▤	
Theme: Communication Systems																					
ELT1090: Analog Communication 1		▤																	■		
ELT1100: Electronic Communication		▤	▤																▤		▤
ELT1110: Security Systems 1	▤	▤																	▤		
ELT2090: Analog Communication 2		▤	▤				▤								▤						
ELT2100: Radio Communication		▤					▤								▤						
ELT2110: Security Systems 2	▤	▤		▤			▤								▤				▤		
ELT2120: Electro-optics		▤					▤												▤		
ELT3100: Analog Communication 3		▤					▤								▤						
ELT3110: Amplifiers		▤					▤								▤				▤		
ELT3130: Data/Telemetry Systems		▤					▤								▤				▤		
Theme: Robotic and Control Systems																					
ELT1130: Robotics 1		▤																	▤		
ELT2130: Magnetic Control Devices		▤					▤								▤				▤		
ELT2140: Robotics 2		▤					▤			▤					▤						
ELT2150: Electronic Controls	▤	▤					▤								▤				▤		
ELT3140: Motors	▤	▤																	■		
ELT3150: Robotics 3		▤					▤								▤						
ELT3160: Control Applications	▤	▤																	▤		

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Electro-Technologies: Connections Across the Curriculum

Across the Curriculum

Electro-Technologies Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Fabrication and Service Principles																			
ELT1010: Electro-assembly 1				▤						▤	■			▤	▤				
ELT2010: Electro-assembly 2	▤			▤				▤		▤	▤			▤	▤				
ELT2020: Electrical Servicing	▤		▤					▤		▤	▤			▤	▤				
ELT3010: Electro-assembly 3										▤	▤			▤	▤				
ELT3020: Electronic Servicing			▤					■		▤	▤			▤	▤				
Theme: Power Systems																			
ELT1030: Conversion & Distribution	▤		▤	■				▤		▤	■			▤	▤				
ELT1050: Electronic Power Supply 1	▤		▤	▤				▤		▤	▤			▤	▤				
ELT2030: Branch Circuit Wiring							▤				▤			▤	▤		▤		
ELT2050: Electronic Power Supply 2								▤			▤			▤	▤				
ELT3030: Power Systems & Services														▤	▤				
ELT3040: Generation/Transformation														▤	▤				
Theme: Computer Logic Systems																			
ELT1060: Digital Technology 1	▤		▤	▤				▤						▤	▤				
ELT1080: Control Systems 1	▤		▤	▤				▤						▤	▤				
ELT2060: Digital Technology 2				▤				▤						▤	▤				
ELT2070: Computer Technology				▤				▤						▤	▤				
ELT2080: Control Systems 2				▤				▤						▤	▤				
ELT3060: Digital Technology 3								▤						▤	▤				
ELT3070: Digital Applications								▤						▤	▤				
ELT3080: Microprocessors								▤						▤	▤				
ELT3090: Microprocessor Interface								▤						▤	▤				
Theme: Communication Systems																			
ELT1090: Analog Communication 1	▤		▤	▤				▤		▤				▤	▤				
ELT1100: Electronic Communication	▤		▤	▤				▤		▤				▤	▤				
ELT1110: Security Systems 1	▤		▤	▤				▤		▤				■	▤				
ELT2090: Analog Communication 2				▤				▤						▤	▤				
ELT2100: Radio Communication				▤				▤						▤	▤				
ELT2110: Security Systems 2				▤				▤						▤	▤				
ELT2120: Electro-optics				▤				▤						▤	▤				
ELT3100: Analog Communication 3								▤						▤	▤				
ELT3110: Amplifiers								▤						▤	▤				
ELT3130: Data/Telemetry Systems								▤						▤	▤				
Theme: Robotic and Control Systems																			
ELT1130: Robotics 1	▤		▤	▤		▤			▤					▤	▤				
ELT2130: Magnetic Control Devices				▤		▤								▤	▤				
ELT2140: Robotics 2				▤		▤								▤	▤				
ELT2150: Electronic Controls				▤		▤								▤	▤		▤		
ELT3140: Motors				▤		▤								▤	▤				
ELT3150: Robotics 3						▤								▤	▤				
ELT3160: Control Applications						▤								▤	▤				

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts. ■

Provides some links with course content, usually through the application of related technologies and/or processes. ▤

Energy and Mines: Connections with Other CTS Strands

Energy and Mines Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Electro Technologies	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Social and Cultural Perspectives																					
ENM1010: Overview of Alberta Geology		▤																			
ENM2010: Managing Alberta's Resources		▤													▤	■					
ENM3010: Energy & the Environment	■	▤												▤	▤					▤	■
Theme: Technology and Applications																					
ENM1020: Nonrenewable Resources		▤						▤		▤				▤	▤				▤		
ENM1050: Renewable Resources		▤						▤		▤				▤	▤				▤		
ENM1060: Consumer Products & Services	▤	▤						▤		▤					▤				▤		
ENM2020: Conventional Oil/Gas I		▤		▤				▤		▤				▤		▤			▤		
ENM2030: Oil Sands/Heavy Oil/Coal 1		▤		▤				▤		▤				▤		▤			▤		
ENM2040: Metals/Nonmetals 1		▤		▤				▤		▤				▤		▤			▤		
ENM2050: Renewable Energy Technology		▤					▤			▤					▤				▤		
ENM2060: Refining Hydrocarbons		▤						▤		▤									▤		
EnM2070: Refining Rocks & Minerals		▤						▤		■									▤		
EnM2080: Supply & Distribution		▤													▤			▤			
E&M3020: Conventional Oil/Gas 2		▤		▤				▤		▤						▤			▤		
ENM3030: Oil Sands/Heavy Oil/Coal 2		▤		▤				▤		▤						▤			▤		
ENM3040: Metals/Nonmetals 2		▤		▤				▤		▤						▤			▤		
ENM3050: Sustainable Energy		▤													▤						
ENM3060: Petrochemicals		▤						▤		▤									▤		
ENM3070: Industrial Materials		▤						▤		■									▤		
ENM3080: Market Basics & Trends		▤													▤			■			
Theme: Management and Conservation																					
ENM1090: Fundamentals of Recycling	■	▤			■				■	■				■	▤				▤		
ENM1100: Conservation Challenge	▤	▤												▤	▤					▤	▤
ENM2090: Energy Designs/Systems 1		▤			■		■			■									▤		
ENM2100: Environmental Safety		▤												▤	▤	■				▤	▤
ENM3090: Energy Designs/Systems 2		▤			■		■			■									▤		
ENM3100: Integrated Resource Management	▤	▤												▤	▤					▤	▤

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Energy and Mines: Connections Across the Curriculum

	Across the Curriculum																		
	Junior High							Senior High											
Energy and Mines Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Social & Cultural Perspectives																			
ENM1010: Overview of Alberta Geology				■										■	▤				
ENM2010: Managing Alberta's Resources	▤	▤						▤	▤										
ENM3010: Energy & the Environment	▤	▤		▤				▤	▤		▤							▤	
Theme: Technology & Applications																			
ENM1020: Nonrenewable Resources		▤		■					▤		▤		▤	▤					
ENM1050: Renewable Resources		▤		■					▤		▤		▤	▤					
ENM1060: Consumer Products & Services		▤		▤					▤		▤		▤	▤					
ENM2020: Conventional Oil/Gas I			▤	▤							▤		▤	■	▤				
ENM2030: Oil Sands/Heavy Oil/Coal 1			▤	▤							▤		▤	■	▤				
ENM2040: Metals/Nonmetals 1			▤	▤							▤		▤	■	▤				
ENM2050: Renewable Energy Technology				▤							▤								
ENM2060: Refining Hydrocarbons				▤									■	■	▤				
EnM2070: Refining Rocks & Minerals				▤									■	■	▤				
EnM2080: Supply & Distribution	▤							▤											
E&M3020: Conventional Oil/Gas 2			▤	▤									■	■	▤				
ENM3030: Oil Sands/Heavy Oil/Coal 2			▤	▤									■	■	▤				
ENM3040: Metals/Nonmetals 2			▤	▤									■	■					
ENM3050: Sustainable Energy	▤							▤											
ENM3060: Petrochemicals				▤									■	■	▤				
ENM3070: Industrial Materials				▤									■	■	▤				
ENM3080: Market Basics & Trends	▤	▤						▤	▤									▤	
Theme: Management & Conservation																			
ENM1090: Fundamentals of Recycling				■							▤		▤	▤					
ENM1100: Conservation Challenge	▤	▤		▤				▤	▤		▤								
ENM2090: Energy Designs/Systems 1			▤	■							▤								
ENM2100: Environmental Safety	▤			▤				▤			▤								
ENM3090: Energy Designs/Systems 2			▤	■							▤								
ENM3100: Integrated Resource Management	▤	▤						▤	▤									▤	

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Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Enterprise and Innovation: Connections with Other CTS Strands

	Other CTS Strands																				
Enterprise and Innovation Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Fabrication Studies	Fashion Studies	Foods	Financial Management	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Getting the Idea																					
ENT1010: Challenge & Opportunity	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Theme: Preparing for Action																					
ENT1020: Planning a Venture	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
ENT2010: Analyzing Ventures	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
ENT2020: Financing Ventures	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Making It Happen																					
ENT2030: Marketing the Venture	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
ENT2040: Implementing the Venture	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
ENT3010: Managing the Venture	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
ENT3020: Expanding the Venture	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤

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Enterprise and Innovation: Connections Across the Curriculum

Across the Curriculum

Enterprise and Innovation Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Getting the Idea																			
ENT1010: Challenge & Opportunity	▤	▤	▤	▤	▤	▤		▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Preparing for Action																			
ENT1020: Planning a Venture	▤	▤	■	▤	▤	▤		▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤
ENT2010: Analyzing Ventures			■							■									
ENT2020: Financing Ventures			■							■									
Theme: Making It Happen																			
ENT2030: Marketing the Venture			■					▤		■							▤		
ENT2040: Implementing the Venture	▤	▤	■	▤	▤	▤		▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤
ENT3010: Managing the Venture			■							■									
ENT3020: Expanding the Venture			■						▤	■									

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Fabrication Studies: Connections with Other CTS Strands

	Other CTS Strands																				
Fabrication Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Materials and Structures																					
CON1010: Basic Tools & Materials		▤			■			▤													
FAB2010: Structural Engineering	■	▤			▤		▤														
FAB2020: Print Reading		▤			▤		▤														
FAB3010: Materials Testing		▤			▤														▤		
FAB3020: Metallurgy Fundamentals		▤						▤											▤		
Theme: Fabrication Processes																					
FAB1040: Oxyacetylene Welding	■	▤						▤											■		
FAB1050: Basic Electric Welding	■	▤						▤	▤										■		
FAB1110: Bar & Tubular Fabrication		▤																			
FAB1090: Sheet Fabrication 1 (Hand Processes)		▤																	▤		
FAB1100: Fabrication Principles		▤				▤													▤		
FAB2030: Oxyfuel Welding		▤																	■		
FAB2040: Thermal Cutting		▤																	▤		
FAB2050: Arc Welding 1	▤	▤							▤												
FAB2060: Arc Welding 2		▤							▤												
FAB2070: Gas Metal Arc Welding 1	▤	▤							▤										■		
FAB2170: Pipe Fitting		▤						▤													
FAB2090: Sheet Fabrication 2 (Machine Processes)		▤																			
FAB2100: Sheet Fabrication 3 (Parallel Line)		▤																			
FAB2110: Forging Fundamentals		▤																			
FAB3030: Gas Tungsten Arc Welding		▤							▤												
FAB3040: Specialized Welding		▤																	▤		
FAB3050: Arc Welding 3		▤							▤												
FAB3060: Arc Welding 4		▤							▤												
FAB3170: Gas Metal Arc Welding 2		▤							▤												
FAB3070: Pipe & Tubular Welding		▤						▤													
FAB3080: Automated Welding		▤							▤												
FAB3090: Sheet Fabrication 4 (Radial Line)		▤													▤						
FAB3110: Sheet Fabrication 5 (Duct Components)		▤																			
Theme: Production Systems and Processes																					
FAB1120: Foundry 1 (One-piece Pattern)		▤						▤													
FAB1130: Principles of Machining		▤						▤													
FAB1160: Production Systems		▤																			
FAB2120: Foundry 2 (Split Pattern)		▤																			
FAB2130: Precision Turning 1		▤																	▤		
FAB2140: Precision Milling 1		▤																	▤		
FAB2150: CNC Turning (Computer Numerical Control)		▤													▤						
FAB2160: Custom Fabrication		▤					▤														
FAB3120: Foundry 3 (Core Molding)		▤																			
FAB3130: Precision Turning 2		▤																			
FAB3140: Precision Milling 2		▤																			
FAB3150: CNC Milling (Computer Numerical Control)		▤													▤						
FAB3160: Prefabrication Principles		▤																			

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Fabrication Studies: Connections Across the Curriculum

Across the Curriculum

Fabrication Studies Modules	Junior High							Senior High												
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Materials and Structures																			
CON1010: Basic Tools & Materials				▤											▤				
FAB2010: Structural Engineering				▤											▤				
FAB2020: Print Reading															▤				
FAB3010: Materials Testing											▤			▤	▤				
FAB3020: Metallurgy Fundamentals														▤	▤				
Theme: Fabrication Processes																			
FAB1040: Oxyacetylene Welding											▤		▤		▤				
FAB1050: Basic Electric Welding											▤				▤				
FAB1110: Bar & Tubular Fabrication			▤												▤				
FAB1090: Sheet Fabrication 1 (Hand Processes)			▤							▤					▤				
FAB1100: Fabrication Principles											▤				▤				
FAB2030: Oxyfuel Welding											▤		▤		▤				
FAB2040: Thermal Cutting													▤		▤				
FAB2050: Arc Welding 1													▤		▤				
FAB2060: Arc Welding 2													▤		▤				
FAB2070: Gas Metal Arc Welding 1													▤		▤				
FAB2170: Pipe Fitting															▤				
FAB2090: Sheet Fabrication 2 (Machine Processes)										▤					▤				
FAB2100: Sheet Fabrication 3 (Parallel Line)										▤					▤				
FAB2110: Forging Fundamentals															▤				
FAB3030: Gas Tungsten Arc Welding													▤		▤				
FAB3040: Specialized Welding													▤		▤				
FAB3050: Arc Welding 3													▤		▤				
FAB3060: Arc Welding 4													▤		▤				
FAB3170: Gas Metal Arc Welding 2													▤		▤				
FAB3070: Pipe & Tubular Welding										▤			▤		▤				
FAB3080: Automated Welding															▤				
FAB3090: Sheet Fabrication 4 (Radial Line)										▤					▤				
FAB3110: Sheet Fabrication 5 (Duct Components)										▤					▤				
Theme: Production Systems and Processes																			
FAB1120: Foundry 1 (One-piece Pattern)				▤											▤				
FAB1130: Principles of Machining			▤												▤				
FAB1160: Production Systems															▤				
FAB2120: Foundry 2 (Split Pattern)															▤				
FAB2130: Precision Turning 1										▤					▤				
FAB2140: Precision Milling 1										▤					▤				
FAB2150: CNC Turning (Computer Numerical Control)										▤					▤				
FAB2160: Custom Fabrication															▤				
FAB3120: Foundry 3 (Core Molding)															▤				
FAB3130: Precision Turning 2										▤					▤				
FAB3140: Precision Milling 2										▤					▤				
FAB3150: CNC Milling (Computer Numerical Control)										▤					▤				
FAB3160: Prefabrication Principles															▤				

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Provides some links with course content, usually through the application of related technologies and/or processes. ▤

Fashion Studies: Connections with Other CTS Strands

Fashion Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Foods	Financial Management	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Production																					
FAS1030: Ready, Set, Sew!		■	▤	▤			▤			■											
FAS1040: Fashion Basics		■	▤			▤	▤			■											
FAS1050: Repair and Recycle		■	▤				▤			■											
FAS1060: Creating Accessories 1		■	▤			▤	▤			■											
FAS1070: Creative Yarns/Textiles		■	▤				▤			■											
FAS2070: Creative Construction		■	▤				▤			■											
FAS2080: Activewear		■	▤				▤			■											
FAS2120: Surface Embellishment		■	▤				▤			■											
FAS2090: Specialty Fabrics 1		■	▤				▤			■											
FAS2100: Sewing for Others		■	▤	▤			▤			■			▤					▤			
FAS2110: Creating Home Decor		■	▤				▤			■											
FAS2160: Creating Accessories 2		■	▤				▤			■											
FAS2150: Upholstery		■	▤				▤			■									■		
FAS2050: Flat Pattern		■	▤				▤			■											
FAS2060: Pattern Drafting 1		■	▤				▤			■											
FAS3040: Contemporary Tailoring		■	▤				▤			■											
FAS3060: Couture		■	▤			▤	▤			■											
FAS3080: Cultural Fashions		■	▤			▤	▤			■										▤	
FAS3090: Specialty Fabrics 2		■	▤				▤			■											
FAS3030: Pattern Drafting 2		■	▤				▤			■											
Theme: Design																					
FAS2030: CAD Patterns 1		■	▤				■			■											
FAS2040: Evolution of Fashion		■	▤				■			■										▤	
FAS2010: Fashion Dynamics		■	▤			▤	■			■											
FAS2020: Fashion Illustration 1		■	▤				■			■											
FAS3020: CAD Patterns 2		■	▤				■			■											
FAS3070: Creators of Fashion		■	▤				■			■											
FAS3010: Fashion Illustration 2		■	▤				■			■											
Theme: Merchandising																					
FAS2140: Fashion Merchandising		■	▤				▤			■								■			
FAS3140: Fashion Retailing		■	▤				▤			■								■			

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Fashion Studies: Connections Across the Curriculum

Across the Curriculum

Fashion Studies Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Production																			
FAS1030: Ready, Set, Sew!			▤																
FAS1040: Fashion Basics			▤																
FAS1050: Repair & Recycle			▤				▤		▤	▤							▤	▤	
FAS1060: Creating Accessories 1			▤				▤										▤		
FAS1070: Creative Yarns/Textiles			▤	▤			▤										▤		
FAS2070: Creative Construction			▤				▤										▤		
FAS2080: Activewear			▤	▤															
FAS2120: Surface Embellishment			▤				▤										▤		
FAS2090: Specialty Fabrics 1			▤	▤															
FAS2100: Sewing for Others			▤												▤				
FAS2110: Creating Home Decor			▤				▤										▤		
FAS2160: Creating Accessories 2			▤				▤										▤		
FAS2150: Upholstery			▤							▤									
FAS2050: Flat Pattern			▤							▤									
FAS2060: Pattern Drafting 1			▤							▤									
FAS3040: Contemporary Tailoring																			
FAS3060: Couture																	▤		
FAS3080: Cultural Fashions		▤							▤								▤		▤
FAS3090: Specialty Fabrics 2			▤	▤															
FAS3030: Pattern Drafting 2			▤							▤									
Theme: Design																			
FAS2030: CAD Patterns 1 (Computer-aided Design)			▤							▤									
FAS2040: Evolution of Fashion		▤							▤								▤	▤	▤
FAS2010: Fashion Dynamics			▤																
FAS2020: Fashion Illustration 1			▤				▤										▤		
FAS3010: Fashion Illustration 2			▤				▤										▤		
FAS3020: CAD Patterns 2 (Computer-aided Design)			▤							▤									
FAS3070: Creators of Fashion		▤															▤	▤	▤
Theme: Merchandising																			
FAS2140: Fashion Merchandising			▤							▤							▤		
FAS3140: Fashion Retailing			▤							▤							▤		

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Financial Management: Connections with Other CTS Strands

	Other CTS Strands																				
Financial Management Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Electro Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: User																					
FIN1010: Financial Information	▤			▤	▤	▤										▤		▤	▤		▤
FIN1020: Service Business 1										▤											
FIN1030: Service Business 2																					
FIN2010: Taxation																					
Theme: User/Preparer																					
FIN2020: Merchandising Business 1										▤								▤			
FIN2030: Merchandising Business 2																					
FIN2040: Financial Software	▤				▤	▤					▤				▤				▤		▤
FIN2050: Financial Simulation																					
FIN3010: Advanced Accounting		▤																▤			
FIN3020: Management Accounting		▤			▤								▤								
FIN3030: Business Organizations		▤														▤					
Theme: User/Analyst																					
FIN3040: Financial Statements		▤								▤								▤	▤		
FIN3060: Financial Analysis		▤																			
FIN3070: Financial Planning		▤																			

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations. ■

Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes. ▤

Financial Management: Connections Across the Curriculum

Across the Curriculum

	Junior High							Senior High											
Financial Management Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: User																			
FIN1010: Financial Information	▤	▤	▤					▤	▤	▤					▤				
FIN1020: Service Business 1			▤							▤									
FIN1030: Service Business 2			▤							▤									
FIN2010: Taxation			▤							▤									
Theme: User/Preparer																			
FIN2020: Merchandising Business 1			▤							▤									
FIN2030: Merchandising Business 2			▤							▤									
FIN2040: Financial Software			▤					▤		▤									
FIN2050: Financial Simulation			▤							▤									
FIN3010: Advanced Accounting			▤							▤									
FIN3020: Management Accounting			▤							▤									
FIN3030: Business Organizations			▤					▤		▤									
Theme: User/Analyst																			
FIN3040: Financial Statements			▤					▤		▤									
FIN3060: Financial Analysis			▤					▤		▤									
FIN3070: Financial Planning			▤					▤		▤									

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Foods: Connections with Other CTS Strands

Foods Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Nutrition																					
FOD1010: Food Basics		■		▤						▤										▤	
FOD2010: Food & Nutrition Basics		■		▤						▤											
FOD2020: Nutrition & the Athlete		■		▤						▤											
FOD2030: Food Decisions & Health		■		▤						▤											
FOD3010: Food for the Life Cycle		■		▤						▤											
FOD3020: Nutrition & Digestion		■		▤						▤											
Theme: Preparation & Presentation																					
FOD1020: Baking Basics		■								▤										▤	
FOD1030: Snacks & Appetizers		■					▤			▤										▤	
FOD2040: Cake & Pastry		■								▤										▤	
FOD2050: Yeast Breads & Rolls		■								▤										▤	
FOD2060: Milk Products & Eggs		■								▤										▤	
FOD2070: Stocks, Soups & Sauces		■								▤										▤	
FOD2080: Vegetables/Fruits/Grains		■								▤										▤	
FOD2090: Creative Cold Foods		■					▤			▤										▤	
FOD2100: Basic Meat Cookery		■								▤										▤	
FOD2110: Fish & Poultry		■								▤										▤	
FOD3030: Creative Baking		■					▤			▤										▤	
FOD3040: Advanced Yeast Products		■								▤										▤	
FOD305: Advanced Soups & Sauces		■								▤										▤	
FOD3060: Food Presentation		■					▤			▤										▤	
FOD3070: Short Order Cooking		■								▤										▤	
FOD3080: Advanced Meat Cookery		■								▤										▤	
FOD3090: Basic Meat Cutting		■								▤										▤	
Theme: Management																					
FOD1040: Meal Planning 1		■								▤										▤	
FOD1050: Fast & Convenience Foods		■								▤										▤	
FOD2120: Meal Planning 2		■								▤										▤	
FOD2130: Vegetarian Cuisine		■								▤										▤	
FOD2140: Rush Hour Cuisine		■								▤										▤	
FOD2150: Food Safety & Sanitation		■								▤										■	
FOD2160: Food Venture		■								■			▤					▤		▤	
FOD3100: Entertaining with Food		■					▤			▤										▤	
FOD3110: Food Processing	▤	■								▤										▤	
FOD3120: Food Evolution/Innovation	▤	■								■										▤	
FOD3130: The Food Entrepreneur		■								■			▤					▤		▤	
Theme: Social & Cultural																					
FOD1060: Canadian Heritage Foods		■								▤										▤	
FOD2170: International Cuisine 1		■								▤										▤	
FOD3140: International Cuisine 2		■								▤										▤	

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Foods: Connections Across the Curriculum

Across the Curriculum

Foods Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Nutrition																			
FOD1010: Food Basics			▤	▤							▤	▤	▤		■				
FOD2010: Food & Nutrition Basics			▤	■	■						■	■	■		■				
FOD2020: Nutrition & the Athlete			▤	■	■						■	■	■		▤	▤			
FOD2030: Food Decisions & Health			▤	■	■						■	■	■		▤	▤			
FOD3010: Food for the Life Cycle			▤	■	■						■	■	■		▤				
FOD3020: Nutrition & Digestion			▤	■	■						■	■	■		▤				
Theme: Preparation & Presentation																			
FOD1020: Baking Basics			▤	▤	▤						▤				▤				
FOD1030: Snacks & Appetizers			▤	▤	▤						▤				▤				
FOD2040: Cake & Pastry			▤	▤	▤						▤				▤				
FOD2050: Yeast Breads & Rolls			▤	▤	▤						▤				▤				
FOD2060: Milk Products & Eggs			▤	▤	▤						▤				▤				
FOD2070: Stocks, Soups & Sauces			▤	▤	▤						▤				▤				
FOD2080: Vegetables/Fruits/Grains			▤	▤	▤						▤				▤				
FOD2090: Creative Cold Foods			▤	▤	▤						▤				▤				
FOD2100: Basic Meat Cookery			▤	▤	▤						▤				▤				
FOD2110: Fish & Poultry			▤	▤	▤						▤				▤				
FOD3030: Creative Baking			▤	▤	▤						▤				▤				
FOD3040: Advanced Yeast Products			▤	▤	▤						▤				▤				
FOD3050: Advanced Soups & Sauces			▤	▤	▤						▤				▤				
FOD3060: Food Presentation			▤	▤	▤						▤				▤		▤		
FOD3070: Short Order Cooking			▤	▤	▤						▤				▤				
FOD3080: Advanced Meat Cookery			▤	▤	▤						▤				▤				
FOD3090: Basic Meat Cutting			▤	▤	▤						▤				▤				
Theme: Management																			
FOD1040: Meal Planning 1					▤										▤				
FOD1050: Fast & Convenience Foods					▤										▤				
FOD2120: Meal Planning 2		■			■										▤			■	
FOD2130: Vegetarian Cuisine		■			▤					▤					▤			■	
FOD2140: Rush Hour Cuisine															▤				
FOD2150: Food Safety & Sanitation				■							▤	■	▤		▤				
FOD2160: Food Venture			■	■						▤	▤				▤				
FOD3100: Entertaining with Food															▤				
FOD3110: Food Processing										▤	▤	▤	▤		▤				
FOD3120: Food Evolution/Innovation										▤	▤	▤	▤		▤				
FOD3130: The Food Entrepreneur			■	■						▤	▤				▤				
Theme: Social & Cultural																			
FOD1060: Canadian Heritage Foods		▤							▤	▤					▤			▤	▤
FOD2170: International Cuisine 1		▤							▤	▤					▤			▤	▤
FOD3140: International Cuisine 2		▤							▤	▤					▤			▤	▤

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Forestry: Connections with Other CTS Strands

Other CTS Strands

Forestry Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Social and Cultural Perspectives																					
FOR1010: Why Forestry?		▤													▤					▤	■
FOR1020: Forest Regions of Canada		▤	▤																	■	■
FOR1040: Woods Survival 1		▤		■																■	■
FOR2010: Making a Difference		▤	▤												▤					▤	■
FOR2030: Managing Alberta Forests		▤													▤	▤					
FOR2040: Woods Survival 2		▤		■												▤				■	■
FOR3010: Issues in Forestry		▤	▤					▤							▤					▤	■
Theme: Technology and Applications																					
FOR1050: Mapping & Aerial Photos		▤		▤				▤												▤	▤
FOR1060: Measuring the Forest 1		▤		▤																	▤
FOR2060: Measuring the Forest 2		▤		▤																	▤
FOR2070: Harvest Practices		▤			▤				▤							▤		▤	■		▤
FOR3060: Measuring the Forest 3		▤																			▤
FOR3070: The Forest Marketplace		▤			▤										▤			▤			
FOR3080: Forest Technology Applications		▤						▤	▤						▤						
Theme: Management and Conservation																					
FOR1090: Forest Ecology 1	▤	▤						▤													▤
FOR1100: Forests Forever 1		▤													▤						▤
FOR2100: Forests Forever 2		▤													▤						▤
FOR2120: Users in the Forest	▤	▤						▤							▤	▤					▤
FOR3090: Forest Ecology 2	▤	▤						▤													▤
FOR3110: Silviculture	■	▤		▤															■		
FOR3120: Integrated Resource Management	▤	▤						▤							▤	▤					▤

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Forestry: Connections Across the Curriculum

	Across the Curriculum																		
	Junior High							Senior High											
Forestry Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Social and Cultural Perspectives																			
FOR1010: Why Forestry?	▤	▤		▤				▤	▤		▤				▤		▤		
FOR1020: Forest Regions of Canada	▤	▤		■				▤	▤		▤	▤					▤		
FOR1040: Woods Survival 1						▤										▤			
FOR2010: Making a Difference	▤	▤		▤				▤	▤								▤		
FOR2030: Managing Alberta Forests	▤	▤						▤	▤										
FOR2040: Woods Survival 2						▤										▤			
FOR3010: Issues in Forestry	▤	▤		▤				▤	▤										
Theme: Technology and Applications																			
FOR1050: Mapping & Aerial Photos		▤	▤			▤										▤			
FOR1060: Measuring the Forest 1			▤	▤		▤						▤				▤			
FOR2060: Measuring the Forest 2			▤	▤		▤						▤				▤			
FOR2070: Harvesting Practices	▤			▤				▤				▤			▤				
FOR3060: Measuring the Forest 3				▤								▤							
FOR3070: The Forest Marketplace	▤	▤						▤	▤						▤				
FOR3080: Forest Technology Applications	▤			▤				▤											
Theme: Management and Conservation																			
FOR1090: Forest Ecology 1				■								■							
FOR1100: Forests Forever 1	▤			▤				▤			▤								
FOR2100: Forests Forever 2	▤			▤				▤			▤								
FOR2120: Users in the Forest	▤							▤											
FOR3090: Forest Ecology 2				■								■							
FOR3110: Silviculture				▤							▤	▤			▤				
FOR3120: Integrated Resource Management	▤							▤											

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Information Processing: Connections with Other CTS Strands

	Other CTS Strands																				
Information Processing Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Electro Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: System Operations																					
INF1010: Computer Operations	▤	▤	■	▤	▤	▤	■	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2010: Workstation Operations									■												
INF3010: Hardware/Software Analysis									■												
INF3020: Local Area Networks									■												
INF2190 Telecommunications 1									■												
INF3180 Telecommunications 2									■												
Theme: Text/Data Input																					
INF1020: Keyboarding 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2030: Keyboarding 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2040: Keyboarding 3	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3030: Keyboarding 4	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3040: Keyboarding 4	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3050: Keyboarding 6	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Productivity Software																					
INF1030: Word Processing 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF1040: Graphics Tools	▤	▤	■	▤	▤	▤	■	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	■	▤
INF1050: Database 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	■	▤	▤	▤
INF1060: Spreadsheet 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	■	▤	▤	▤
INF2050: Word Processing 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2060: Electronic Publishing 1	▤	▤	■	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
INF2070: Database 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
INF2080: Spreadsheet 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2130: Multimedia Authoring 1	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3060: Word Processing 3	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3070: Electronic Publishing 2	▤	▤	■	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
INF3080: Information Management Tools	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3130: Multimedia Authoring 2	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Applied Processing																					
INF2090: Correspondence		■																■			
INF2100: Reports																		■			
INF2110: Tables/Forms																					
INF2120: Document Production 1																					
INF3090: Word Processing Applications																					
INF3100: Specialization 1																					
INF3110: Specialization 2																					
INF3120: Document Production 2																					
Theme: Dynamic Environment																					
INF1070: Hypermedia Tools	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF1090: Information Highway 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2140: Process Control					▤				■					▤							
INF2200: Information Highway 2									▤									▤			
INF3140: Expert Systems	▤			■	▤			▤	■				▤	▤	▤						▤
INF3190: Information Highway 3									▤												
INF3200: Internet Services									▤												
Theme: Programming																					
INF1080: Programming 1									■												
INF2150: Programming 2									■												
INF2160: Programming 3									■												
INF2170: Programming 4									■												
INF2180: Programming 5									■												
INF3150: Programming Application 1																					
INF3160: Programming Application 2																					
INF3170: Programming Application 3																					

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Information Processing: Connections Across the Curriculum

Across the Curriculum

Information Processing Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: System Operations																			
INF1010: Computer Operations	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
INF2010: Workstation Operations																			
INF3010: Hardware/Software Analysis																			
INF3020: Local Area Networks																			
INF2190: Telecommunications 1				▤					▤	▤	▤			■					
INF3180: Telecommunications 2				▤					▤	▤	▤			■					
Theme: Text/Data Input																			
INF1020: Keyboarding 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2030: Keyboarding 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2040: Keyboarding 3	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3030: Keyboarding 4	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3040: Keyboarding 5	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3050: Keyboarding 6	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Productivity Software																			
INF1030: Word Processing 1	■	■		■	■	▤	▤	■	■		■	■	■	■	■	▤		■	■
INF1040: Graphics Tools	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤
INF1050: Database 1			■	■			▤			■	■	■	■	■				▤	
INF1060: Spreadsheet 1		■	■	■			▤		■	■	■	■	■	■					
INF2050: Word Processing 2	▤	▤		▤	▤		▤	▤	▤		▤	▤	▤	▤	▤			▤	▤
INF2060: Electronic Publishing 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2070: Database 2																			
INF2080: Spreadsheet 2																			
INF2130: Multimedia Authoring 1	▤	▤	▤	▤	▤	▤		▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF3060: Word Processing 3																			
INF3070: Electronic Publishing 2																			
INF3080: Information Management Tools																			
INF3130: Multimedia Authoring 2	▤	▤	▤	▤	▤	▤		▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Applied Processing																			
INF2090: Correspondence	■	■						■	■									■	
INF2100: Reports	■	■		■				■	■		■	■	■	■				■	
INF2110: Tables/Forms				■							■	■	■	■					
INF2120: Document Production 1																			
INF3090: Word Processing Applications																			
INF3100: Specialization 1																			
INF3110: Specialization 2																			
INF3120: Document Production 2																			
Theme: Dynamic Environment																			
INF1070: Hypermedia Tools	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF1090: Information Highway 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
INF2140: Process Control																			
INF2200: Information Highway 2																			
INF3140: Expert Systems																			
INF3190: Information Highway 3																			
INF3200: Internet Services																			
Theme: Programming																			
INF1080: Programming 2			■							■									
INF2150: Programming 2										■									
INF2160: Programming 3										■									
INF2170: Programming 4										■									
INF2180: Programming 5										■									
INF3150: Programming Application 1										■									
INF3160: Programming Application 2										■									
INF3170: Programming Application 3										■									

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Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Legal Studies: Connections with Other CTS Strands

	Other CTS Strands																				
Legal Studies Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Foods	Financial Management	Forestry	Information Processing	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Personal Context																					
LGS1010: You & the Law 1 (as a Consumer and as a Family Member)				▤										▤							
LGS1020: You & the Law 2 (In Society and in the Workplace)																					
Theme: Societal Context																					
LGS2010: Family Law		▤		▤												▤					
LGS2020: Labour Law		▤								▤						▤		▤			
LGS2030: Environmental Law	▤	▤			▤	▤			▤	▤	▤				▤	▤					▤
LGS2050: Law & the Traveller		▤		▤												▤				■	
LGS3010: Consumer & Property Law		▤	▤				▤			▤						▤		▤			
LGS3020: Dispute Resolution		▤																			
LGS3040: Negligence		▤														▤					
LGS3050: Law & Small Business	▤	▤			▤					■				▤		▤		▤			
LGS3060: Controversy & Change		▤														▤					▤
LGS3070: Landmark Decisions		▤														▤					
LGS3080: Criminal Law		▤														▤		▤			

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Legal Studies: Connections Across the Curriculum

	Across the Curriculum																		
	Junior High							Senior High											
Legal Studies Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Personal Context																			
LGS1010: You & the Law 1 (as a Consumer & as a Family Member)	▤	▤						▤	▤						▤				
LGS1020: You & the Law 2 (in Society & in the Workplace)	▤	▤						▤	▤						▤				
Theme: Societal Context																			
LGS2010: Family Law	▤							▤											
LGS2020: Labour Law	▤							▤	▤										
LGS2030: Environmental Law	▤			▤				▤	▤		▤								
LGS2050: Law & the Traveller	▤							▤											
LGS3010: Consumer & Property Law	▤							▤											
LGS3020: Dispute Resolution	▤							▤											
LGS3040: Negligence	▤							▤											
LGS3050: Law & Small Business	▤							▤											
LGS3060: Controversy & Change	▤							▤	▤										
LGS3070: Landmark Decisions	▤							▤	▤										
LGS3080: Criminal Law	▤							▤			▤								

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Logistics: Connections with Other CTS Strands

Logistics Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Information Processing	Legal Studies	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Theme: Introduction to Logistics																					
LOG1010: Logistics	▤	■						▤		▤					▤	▤		▤			
Theme: Warehousing and Distribution																					
LOG1020: Warehouse & Distribute 1	▤	■						▤		▤					▤	▤		▤			
LOG2010: Warehouse & Distribute 2	▤	■						▤		▤					▤	▤		▤			
LOG3010: Warehouse & Distribute 3	▤	■						▤		▤					▤	▤		▤			
Theme: Traffic and Transportation																					
LOG1030: Traffic & Transport 1	▤	■						▤		▤					▤	▤		▤			
LOG2020: Traffic & Transport 2	▤	■						▤		▤					▤	▤		▤			
LOG3030: Traffic & Transport 3	▤	■						▤		▤					▤	▤		▤			
Theme: Purchasing																					
LOG1040: Purchasing 1	▤	■						▤		▤					▤	▤		▤			
LOG2030: Purchasing 2	▤	■						▤		▤					▤	▤		▤			
LOG3030: Purchasing 3	▤	■						▤		▤					▤	▤		▤			
Theme: Inventory Management and Control																					
LOG2040: Inventory Management 1	▤	■						▤		▤					▤	▤		▤			
LOG3040: Inventory Management 2	▤	■						▤		▤					▤	▤		▤			

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Logistics: Connections Across the Curriculum

Across the Curriculum

	Junior High							Senior High											
Logistics Modules	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences
Theme: Introduction to Logistics																		
LOG1010: Logistics		▤													▤			▤
Theme: Warehousing and Distribution																		
LOG1020: Warehouse & Distribute 1		▤													▤			
LOG2010: Warehouse & Distribute 2		▤													▤			
LOG3010: Warehouse & Distribute 3		▤													▤			
Theme: Traffic & Transportation																		
LOG1030: Traffic & Transport 1		▤													▤			▤
LOG2020: Traffic & Transport 2		▤													▤			▤
LOG3030: Traffic & Transport 3		▤													▤			▤
Theme: Purchasing																		
LOG1040: Purchasing 1		▤													▤			
LOG2030: Purchasing 2		▤													▤			
LOG3030: Purchasing 3		▤													▤			
Theme: Inventory Management and Control																		
LOG2040: Inventory Management 1		▤													▤			
LOG3040: Inventory Management 2		▤													▤			

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Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Management and Marketing: Connections With Other CTS Strands

	Other CTS Strands																				
Management & Marketing Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Electro Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Legal Studies	Logistics	Information Processing	Mechanics	Tourism Studies	Wildlife
Theme: Business Management Systems and Strategies																					
MAM2010: Managing for Quality	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3010: The Business Organization	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3020: Business in the Canadian Economy	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3030: Business in the Global Marketplace	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Marketing Systems and Strategies																					
MAM1010: Management & Marketing Basics	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM1020: Quality Customer Service	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM2020: Promotion: Advertising	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM2030: Promotion: Visual Merchandising	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM2040: Retail Operations	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3040: Promotion: Sales Techniques	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3050: Distributing Goods & Services	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3060: Setting Up a Retail Store	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Theme: Information Management Systems and Strategies																					
MAM1030: Communication Strategies 1	▤	■	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM2050: Office Systems 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM2060: Communication Strategies 2	▤	▤	■	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM2080: Records Management 1	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM3070: Office Systems 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM3080: Communication Strategies 3	▤	▤	■	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤
MAM3090: Records Management 2	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤

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Management and Marketing: Connections Across the Curriculum

Across the Curriculum

Management & Marketing Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Business Management Systems and Strategies																			
MAM2010: Managing for Quality								▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
MAM3010: The Business Organization																			
MAM3020: Business in the Canadian Economy									■										
MAM3030: Business in the Global Marketplace									■										
Theme: Marketing Systems and Strategies																			
MAM1010: Management & Marketing Basics		■			■		▤										▤		
MAM1020: Quality Customer Service			■				▤										▤		
MAM2020: Promotion: Advertising							■										■		
MAM2030: Promotion: Visual Merchandising							■										■		
MAM2040: Retail Operations			■							■									
MAM3040: Promotion: Sales Techniques							■										■		
MAM3050: Distributing Goods & Services																			
MAM3060: Setting Up a Retail Store																			
Theme: Information Management Systems and Strategies																			
MAM1030: Communication Strategies 1	■							■											
MAM2050: Office Systems 1																			
MAM2060: Communication Strategies 2								■											
MAM2080: Records Management 1																			
MAM3070: Office Systems 2																			
MAM3080: Communication Strategies 3								■											
MAM3090: Records Management 2																			

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Mechanics: Connections with Other CTS Strands

Mechanics Modules	Other CTS Strands Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technologies	Cosmetology Studies	Design Studies	Energy and Mines	Electro Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Legal Studies	Logistics	Information Processing	Managment and Marketing	Tourism Studies	Wildlife
Theme: Vehicle Design and Ownership																					
MEC1010: Modes & Mechanisms		■			▤		▤			▤				▤	▤			▤			
MEC1020: Vehicle Service & Care	▤	■							▤	▤								▤	▤		
MEC2010: Vehicle Detailing		■								▤								▤	▤		
MEC2020: Vehicle Maintenance	▤	■							▤	▤								▤	▤		
MEC3010: Buying & Selling Vehicles		■								▤		▤						▤	■		
MEC3020: Vehicle Value Appraisal		■								▤									▤		
Theme: Propulsion Systems																					
MEC1040: Engine Fundamentals	▤	■								▤					▤			▤			
MEC2030: Lubrication & Cooling		■								▤											
MEC2040: Fuel & Exhaust Systems		■						▤		▤											
MEC2050: Alternative Fuel Engines		■						■		▤											
MEC2060: Ignition Systems		■							▤	▤											
MEC2070: Emission Controls		■						▤	▤	▤											
MEC3030: Engine Diagnosis		■								▤								▤			
MEC3040: Engine Tune up		■							▤	▤											
MEC3050: Engine Replacement		■								▤											
MEC3060: Engine Reconditioning 1		■								▤											
MEC3070: Engine Reconditioning 2		■								▤											
MEC3080: Alternative Energy Systems		■								▤									▤		
Theme: Guidance and Control Systems																					
MEC1090: Electrical Fundamentals	▤	■							■	▤					▤						
MEC1110: Pneumatics & Hydraulics	▤	■								▤					▤			▤			
MEC1130: Mechanical Systems		■								▤								▤			
MEC2090: Electrical Components	▤	■							▤	▤											
MEC2100: Power Assist Accessories		■							▤	▤											
MEC2110: Braking Systems		■								▤				■							
MEC2120: Hydraulic Accessories		■								▤											
MEC2130: Drive Trains		■								▤											
MEC2140: Transmissions/Transaxles		■								▤											
MEC3090: Computer Systems		■							■	▤											
MEC3100: Safety Systems		■							▤	▤									▤		
MEC3110: Climate Control		■								▤											
MEC3120: Power Assisting		■							▤	▤											
MEC3130: Automatic Transmissions		■								▤											
MEC3140: Drive Train Repair		■								▤											
Theme: Suspension and Structural Systems																					
MEC1150: Ride & Control Systems		■								▤								▤			
MEC1160: Structures & Materials		■						▤		▤								▤			
MEC1170: Metal Forming & Finishing		■								▤				■				▤			
MEC1190: Surface Preparation 1		■								▤				▤				▤			
MEC2150: Suspension Systems		■								▤											
MEC2160: Steering Systems		■								▤											
MEC2170: Metal Repair & Finishing		■								▤				■							
MEC2180: Trim Replacement		■								▤											
MEC2190: Surface Preparation 2		■								▤											
MEC2200: Refinishing 1		■								▤				▤							
MEC2210: Touch-up & Finishing		■								▤											
MEC2220: Interior Repairs		■								▤	■										
MEC3150: Wheel Alignment		■								▤											
MEC3160: Body Repair Estimation		■								▤											
MEC3170: Damage Analysis		■								▤											
MEC3180: Damage Repair 1		■								▤				▤							
MEC3190: Damage Repair 2		■								▤				▤							
MEC3200: Refinishing 2		■								▤				▤							
MEC3210: Plastic & Fibreglass		■								▤				▤							
MEC3220: Glass Replacement		■								▤											
MEC3230: Refinishing 3		■								▤				▤							

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Mechanics: Connections Across the Curriculum

Across the Curriculum

Mechanics Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Vehicle Design and Ownership																			
MEC1010: Modes & Mechanisms	▤		▤	▤				▤		▤					▤		▤		
MEC1020: Vehicle Service & Care	▤		▤					▤		▤	▤				▤				
MEC2010: Vehicle Detailing	▤							▤							▤				
MEC2020: Vehicle Maintenance	▤		▤					▤		▤					▤				
MEC3010: Buying & Selling Vehicles	▤	▤	▤					▤		▤					▤				
MEC3020: Vehicle Value Appraisal			▤					▤		▤					▤				
Theme: Propulsion Systems																			
MEC1040: Engine Fundamentals	▤		▤	▤				▤		▤					▤				
MEC2030: Lubrication & Cooling										▤					▤				
MEC2040: Fuel & Exhaust Systems								▤							▤				
MEC2050: Alternative Fuel Engines								▤							▤				
MEC2060: Ignition Systems			▤					▤		▤					▤				
MEC2070: Emission Controls								▤							▤				
MEC3030: Engine Diagnosis								▤							▤				
MEC3040: Engine Tune up															▤				
MEC3050: Engine Replacement															▤				
MEC3060: Engine Reconditioning 1								▤		▤					▤				
MEC3070: Engine Reconditioning 2										▤					▤				
MEC3080: Alternative Energy Systems								▤							▤				
Theme: Guidance and Control Systems																			
MEC1090: Electrical Fundamentals			▤	▤						▤	■			▤	▤				
MEC1110: Pneumatics & Hydraulics	▤			▤				▤			▤				▤				
MEC1130: Mechanical Systems	▤			▤				▤			▤			▤	▤				
MEC2090: Electrical Components				▤				▤			▤			▤	▤				
MEC2100: Power Assist Accessories								▤							▤				
MEC2110: Braking Systems			▤					▤			▤				▤				
MEC2120: Hydraulic Accessories								▤							▤				
MEC2130: Drive Trains								▤							▤				
MEC2140: Transmissions/Transaxles								▤							▤				
MEC3090: Computer Systems								▤							▤				
MEC3100: Safety Systems								▤							▤				
MEC3110: Climate Control								▤							▤				
MEC3120: Power Assisting															▤				
MEC3130: Automatic Transmissions								▤		▤					▤				
MEC3140: Drive Train Repair															▤				
Theme: Suspension and Structural Systems																			
MEC1150: Ride & Control Systems	▤														▤				
MEC1160: Structures & Materials	▤														▤				
MEC1170: Metal Forming & Finishing	▤														▤				
MEC1190: Surface Preparation	▤														▤				
MEC2150: Suspension Systems															▤				
MEC2160: Steering Systems								▤							▤				
MEC2170: Metal Repair & Finishing								▤							▤				
MEC2180: Trim Replacement								▤							▤				
MEC2190: Surface Preparation 2															▤				
MEC2200: Refinishing 1								▤							▤				
MEC2210: Touch up & Finishing															▤				
MEC2220: Interior Repairs								▤							▤				
MEC3150: Wheel Alignment										▤					▤				
MEC3160: Body Repair Estimation								▤						▤	▤				
MEC3170: Damage Analysis								▤							▤				
MEC3180: Damage Repair 1															▤				
MEC3190: Damage Repair 2								▤							▤				
MEC3200: Refinishing 2								▤							▤				
MEC3210: Plastic & Fibreglass								▤							▤				
MEC3220: Glass Replacement								▤							▤				
MEC3230: Refinishing 3								▤							▤				

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Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Tourism Studies: Connections with Other CTS Strands

Tourism Studies Modules	Other CTS Strands																				
	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Electro -Technologies	Enterprise and Innovation	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Wildlife
Theme: Nature of the Industry																					
TOU1010: The Tourism Industry																					
TOU1020: People & Places																					
TOU1030: Quality Guest Service		▤	▤			▤															
TOU2010: Tourism Events			▤				▤			▤			▤						▤		
Theme: Food																					
TOU1040: The Food Sector													■						▤		
TOU2040: Food Functions													■								
TOU3030: Food Service Operations										▤			■								
Theme: Accommodation																					
TOU1050: The Accommodation Sector										▤									▤		
TOU2050: Meetings & Conferences			▤							▤			▤						▤		
TOU3040: Hotel/Motel Operations										▤									▤		
TOU3050: Alternative Accommodations	▤									▤					▤				▤		▤
Theme: Travel																					
TOU1060: The Travel Sector	▤														▤				▤		▤
TOU2060: Tourism Destinations 1																	▤				
TOU2070: Tourism Destinations 2																	▤				
TOU2080: Travel Planning																	▤		▤		
TOU3060: Travel Agency Operations										▤									▤		
TOU3070: Reservations & Ticketing																					
TOU3080: Air Transportation																			▤		
TOU3090: Surface Transportation																			▤		
Theme: Attractions																					
TOU1070: The Attractions Sector															▤		▤		▤		▤
TOU2090: Tourism Interpretation 1			▤																		
TOU2100: Tourism Interpretation 2			▤																		
TOU3100: Attractions Operations										▤							▤		▤		
TOU3110: Adventure & Ecotourism	▤									▤					▤				▤		▤

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Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Tourism Studies: Connections Across the Curriculum

Across the Curriculum

Tourism Studies Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Nature of the Industry																			
TOU1010: The Tourism Industry																			
TOU1020: People & Places		■							▤										▤
TOU1030: Quality Guest Service					▤										▤				
TOU2010: Tourism Events																			
Theme: Food																			
TOU1040: The Food Sector				▤		▤	▤				▤	▤	▤						
TOU2040: Food Functions				▤															
TOU3030: Food Service Operations				▤							▤	▤	▤						
Theme: Accommodation																			
TOU1050: The Accommodation Sector																			
TOU2050: Meetings & Conferences																			
TOU3040: Hotel/Motel Operations																			
TOU3050: Alternative Accommodations																			
Theme: Travel																			
TOU1060: The Travel Sector																			▤
TOU2060: Tourism Destinations 1		▤							▤										▤
TOU2070: Tourism Destinations 2		▤							▤										▤
TOU2080: Travel Planning		▤							▤										▤
TOU3060: Travel Agency Operations																			
TOU3070: Reservations & Ticketing																			
TOU3080: Air Transportation																			
TOU3090: Surface Transportation																			
Theme: Attractions																			
TOU1070: The Attractions Sector																			
TOU2090: Tourism Interpretation 1																			
TOU2100: Tourism Interpretation 2																			
TOU3100: Attractions Operations																			
TOU3110: Adventure & Ecotourism																			

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.	■
Provides some links with course content, usually through the application of related technologies and/or processes.	▤

Wildlife: Connections with Other CTS Strands

Other CTS Strands

Wildlife Modules	Agriculture	Career Transitions	Communication Technology	Community Health	Construction Technolgies	Cosmetology Studies	Design Studies	Energy and Mines	Electro-Technologies	Enterprise and Innovations	Fashion Studies	Financial Management	Foods	Fabrication Studies	Forestry	Legal Studies	Logistics	Information Processing	Managment and Marketing	Mechanics	Tourism Studies
Theme: Social and Cultural Perspectives																					
WLD1010: What is Wildlife?		▤													▤	▤		▤			▤
WLD1020: Natural History of Wildife		▤	▤												■			▤			▤
WLD1030: Outdoor Experiences 1		▤		■						▤					■	▤					■
WLD2020: Measuring the Value	▤	▤	▤					▤				▤	▤		■			▤			■
WLD2030: Outdoor Experiences 2		▤		■						▤					■	▤					■
WLD3020: Making a Difference	▤	▤	▤					▤							■			▤			▤
Theme: Technology and Applications																					
WLD2040: Wildlife Spaces & Species	▤	▤						▤							■			▤			■
WLD3040: Wildlife Research		▤							▤						■			▤			
Theme: Management and Conservation																					
WLD1050: Taking Responsibility	▤	▤	▤					▤							▤			▤			▤
WLD1070: Hunting & Game Management 1		▤		■						▤					▤	▤					▤
WLD1080: Angling & Fish Management		▤		■						▤			▤		▤	▤					▤
WLD2060: Interactions	▤	▤						▤							▤			▤			■
WLD2070: Hunting & Game Management 2		▤		■						▤					▤	▤					▤
WLD2090: Issues in Wildlife 1	▤	▤						▤							▤	▤		▤			▤
WLD3050: Wildlife Management 1	▤	▤						▤	▤			▤			■	▤		▤			▤
WLD3060: Wildlife Management 2	▤	▤						▤	▤			▤			■	▤		▤			▤
WLD3090: Issues in Wildlife 2	▤	▤						▤							▤	▤		▤			▤

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical situations.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

Wildlife: Connections Across the Curriculum

Across the Curriculum

Wildlife Modules	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Theme: Social and Cultural Perspectives																			
WLD1010: What is Wildlife?	▤	▤		■				▤	▤		■	■			▤				
WLD1020: Natural History of Wildife	▤	▤		■				▤	▤		■	■							
WLD1030: Outdoor Experiences 1				▤		■										■			
WLD2020: Measuring the Value	▤	▤		▤				▤	▤		▤						▤		
WLD2030: Outdoor Experiences 2				▤		■										■			
WLD3020: Making a Difference	▤	▤		▤				▤	▤		▤						▤		
Theme: Technology and Applications																			
WLD2040: Wildlife Spaces & Species	▤			■				▤			■	■							
WLD3040: Wildlife Research	▤			■				▤			■	■			▤				
Theme: Management and Conservation																			
WLD1050: Taking Responsibility	▤	▤		▤				▤	▤		▤				▤		▤		
WLD1070: Hunting & Game Management 1	▤			■		▤		▤								▤			
WLD1080: Angling & Fish Management	▤			■		▤		▤								▤			
WLD2060: Interactions	▤	▤		▤				▤	▤		▤						▤		
WLD2070: Hunting & Game Management 2	▤			■		▤		▤								▤			
WLD2090: Issues in Wildlife 1	▤	▤		▤				▤	▤		■								
WLD3050: Wildlife Management 1	▤			▤				▤			■	■			▤				
WLD3060: Wildlife Management 2	▤			▤				▤			■	■			▤				
WLD3090: Issues in Wildlife 2	▤	▤		▤				▤	▤		■								

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and skill components in practical contexts. ■

C. Sample Integrated Projects

This section provides descriptions of projects that teachers have implemented in the classroom. These projects establish connections and integrate learning across CTS strands and/or with core and complementary programs. Each sample project identifies relevant curriculum areas, the steps involved in the project, the target audience, the project parameters (including time, facility, equipment), resources needed and contact(s) for further information.

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20. Students Set up Their Own Resource Company 77

INTEGRATED PROJECT 1: KEEPING BOOKS FOR A MECHANICS DEPARTMENT

CURRICULUM CORRELATION	Financial Management, Mechanics
PROJECT DESCRIPTION	Students in Financial Management work with students in Mechanics to help them set up the accounting records. Financial Management students design work order forms, prepare a chart of accounts, the accounts receivable, accounts payable, etc. This incorporates two modules in Financial Management (Financial Management Software, Financial Accounting Simulation) and one in Information Processing (Spreadsheet).
STEPS IN THE PROCESS	1. Students design and create the set of books, 2. Use computer software 3. Design appropriate forms - work orders, inventory records, 4. Financial Management student(s) instruct(s) Mechanics students on use of spreadsheet and accounting package, 5. Produce financial information, statements.
PARAMETERS	Regular classroom can be used (access to Mechanics lab is necessary). Must have access to a computer(s) and appropriate software.
TARGET AUDIENCE	Financial Management students (Intermediate or Advanced) and Mechanics students. Could possibly be completed in time frame of two modules.
RESOURCES NEEDED	• Computer(s), • Software, and • Background of Mechanics operations (consult Mechanics instructor)
CONTACT	Shelly Gurba, Edwin Parr Composite Community School, Athabasca, Alberta Telephone: 403–675–2285
DATE OF SUBMISSION	November 22, 1995

INTEGRATED PROJECT 2: MANAGING FUNDS FOR DRAMA, FINE ARTS AND FASHION STUDIES EVENTS AT THE SCHOOL

CURRICULUM CORRELATION	Financial Management, Information Processing
PROJECT DESCRIPTION	Students use Financial Management and Information Processing skills to manage the funds for Drama, Fine Arts and Fashion Studies events. The modules that would be used are: • FIN1020: Setting up accounting records • FIN1030: Closing books and financial statement budget • FIN1010: Business and banking procedures • INF3070: Document Production - dtp
STEPS IN THE PROCESS	1. Detailed planning of event with appropriate department(s) 2. Budget prepared 3. Preparation of appropriate items such as tickets, receipts, accounting forms, security procedures, etc. 4. Entry of data and ongoing responsibilities and duties 5. Preparation of final reports and documents.
PARAMETERS	Access to computer(s) and appropriate software (accounting, word processing).
TARGET AUDIENCE	Financial Management students
RESOURCES NEEDED	• Computer(s) • Software.
CONTACT	
DATE OF SUBMISSION	October 2, 1995

INTEGRATED PROJECT 3: PRODUCTION OF VIDEOS FOR TEXTBOOK SUPPORT

CURRICULUM CORRELATION	Communication Technology, Design Studies, English, Science, Art, Drama
PROJECT DESCRIPTION	Production of short (3–5 min) videos for textbook support (Nelson Canada)
STEPS IN THE PROCESS	1. Met with Vice-President of Nelson Canada 2. Organized team of teachers, students, etc. 3. Storyboard and script prepared • Science teacher and CTS students would be responsible for this 4. Use of Premiere and editing suite to construct project • CTS students would do this 5. Viewing and approval by client
PARAMETERS	Video editing to create QuickTime movies for presentations or CD ROM production
TARGET AUDIENCE	Science teachers and students across Canada
RESOURCES NEEDED	• 2 - SVHS cameras • Quadra 650 with 2 GIG array • CD ROM • Rasterpos Movie Pak • 72 MB Ram • Syquest Drive • Scanner.
CONTACT	Garry Kroy, Austin O'Brien, Edmonton, Alberta, Telephone: 403–466–3161, Fax: 403–466–6994, or, Bob Ritter, Archbishop Macdonald, Edmonton, Alberta, Telephone: 403–451–1470, Fax: 403–455–5571
DATE OF SUBMISSION	October 13, 1995

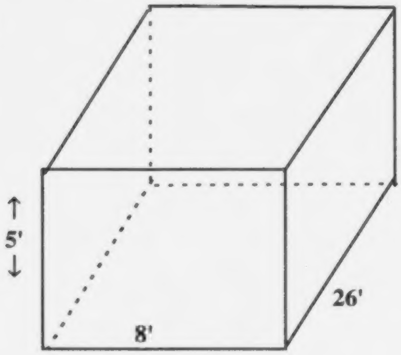
INTEGRATED PROJECT 4: SCHOOL NEWSPAPER\EDMONTON SUN PARTNERSHIP

CURRICULUM CORRELATION	Communication Technology, Information Processing, English, Art, Drama
PROJECT DESCRIPTION	School Newspaper/Edmonton Sun Partnership/Yearbook—develops skills in a number of areas critical to successful publishing of a newspaper.
STEPS IN THE PROCESS	1. Planning and preparation - a large template is developed including key articles, people, etc. 2. Newspaper staff meet once a week throughout the semester • Meet at lunch, students from various courses 3. Word Pro start work on Monday 4. Distribution is Friday • The distribution would be to all paid subscribers, feeder schools, newly registered students, sponsors, etc.
PARAMETERS	5 editions printed (half way through 1st semester, Christmas, halfway through 2nd semester and end of school year/Graduation edition).
TARGET AUDIENCE	All students and staff at the school. Also grade 9 at feeder schools.
RESOURCES NEEDED	• CTS lab with Word Pro and Desktop Publishing software • Mac 475 • Quadra 610 • Scanner • 11 X 17 laser printer • Pagemaker • ClarisWorks
CONTACT	Garry Kroy, Austin O'Brien High School, Edmonton, Alberta Telephone: 403–466–3161, Fax: 403–466–6994
DATE OF SUBMISSION	October 13, 1995

INTEGRATED PROJECT 5: DESIGN AND PRODUCTION OF CATTLE FEEDERS, CALF SHEDS AND LOADING SHOOTS

CURRICULUM CORRELATION	Agriculture, Design Studies, Fabrication Studies, Mathematics
PROJECT DESCRIPTION	Design and production of cattle feeders 5' x 7' x 26'; calf sheds 8'x 5'x 26'; loading shoots 19'x 14'x 6'
STEPS IN THE PROCESS	Students designed project and jigs from customer sketches and oral instructions. Steps were as follows: 1. Drawings were produced 2. Cutting lists were prepared 3. Jigs were produced 4. Cutting lists were used to precut all the pieces before assembling 5. Unit was produced in halves 6. Halves were tacked together to make the whole unit
PARAMETERS	Welding shop and one semester - 6 credit
TARGET AUDIENCE	Students in DES1060, DES2020, AGR2100, FAB3050, FAB3060, FAB3070 Business community - farmers, agri-business
RESOURCES NEEDED	• arc welding machines • cutting torches • GMAW machines • hand tools
CONTACT	Willie Cozak, Willow Creek Composite High School, Claresholm, Alberta Telephone: 403–625–3387, Fax: 403–625–2642
DATE OF SUBMISSION	October 9, 1995

Calf Shed



INTEGRATED PROJECT 6: "BIG BAND DANCE"

CURRICULUM CORRELATION	Foods, Marketing & Management, Fine and Performing Arts
PROJECT DESCRIPTION	The "Big Band Dance" proved a successful integration project as a joint venture between several curriculum strands involving CTS and the Fine and Performing Arts Department.
STEPS IN THE PROCESS	1. Planning: • each area teachers and students planned their own segment of the project • joint committee of teachers planned final integration 2. Marketing: • marketing class provided posters, sold tickets, provided decorations and supervised the decorating of the dance hall. 3. Food Preparation: • Students in Foods prepared the food for the service 4. Setup and Service: • CTS teachers, staff, parent volunteers served and cleared up after the banquet 5. Entertainment and Dance: • Instrumental and vocal entertainment provided by Fine and Performing Arts students
PARAMETERS	
TARGET AUDIENCE	The project provided a wonderful opportunity for CTS staff to interact with the community and showcase some of the programs offered at the school.
RESOURCES NEEDED	
CONTACT	Merv Lee, Lester B. Pearson High School, Calgary, Alberta Telephone: 403–280–6565, Fax: 403–777–7158
DATE OF SUBMISSION	October, 1995

INTEGRATED PROJECT 7: IDEAS FOR A FINAL PROJECT FOR ALL CTS STUDENTS (WORKING IN GROUPS) INCLUDES LEARNINGS FROM AT LEAST THREE OR FOUR STRANDS

CURRICULUM CORRELATION	Various	
PROJECT DESCRIPTION	See below for ideas for Final Project	
STEPS IN THE PROCESS	1. group members complete and present CTS Final Project - Proposal Sheet which includes: • name of group members (maximum of 4) • CTS strands involved (minimum of 3) • objective • schedule • references • parameters • materials • cost 2. approved proposals returned to students and students begin work on project 3. final project is handed in with Student Evaluation section of the Evaluation Checklist completed 4. Presentation of final projects to class.	
PARAMETERS	Depends on the project proposed	
TARGET AUDIENCE	Other students and staff	
RESOURCES NEEDED	Depends on the project proposed	
CONTACT	Brian Andrus, Stony Plain Central, Stony Plain, Alberta Telephone: 403–963–2203, Fax: 403–963–2721	
DATE OF SUBMISSION		
IDEAS FOR FINAL PROJECT	• Cultural Research • Set up a restaurant • Space station • Develop a project (similar to Jr. Achievement)	• Cookbook (teens, ethnic, ...) • Prototype a unique utensil • Silk screen duffle bag

INTEGRATED PROJECT 8: COMPUTER DESIGNS INC. - BUSINESS PORTFOLIO

CURRICULUM CORRELATION	Financial Management, Information Processing, Management and Marketing
PROJECT DESCRIPTION	This venture enables businesses within the community to access and utilize laser quality documents and computerized data banks.
STEPS IN THE PROCESS	1. Students from Tofield School approach businesses individually to do a needs assessment 2. In consultation with the business advisor and the business person, a plan is created for the documentation or data bank(s) needed 3. Quotation of cost is developed and presented to client 4. Consultation continues throughout the design and implementation process as drafts are prepared and presented 5. The finished product is produced and delivered 6. Invoice for product is prepared.
PARAMETERS	Hardware and software capability in spreadsheets, databases, desktop publishing, word processing
TARGET AUDIENCE	Local businesses
RESOURCES NEEDED	• Computers • Appropriate software
CONTACT	Jeff Myck, Tofield School, Tofield, Alberta T0B 4J0 Telephone: 403–662–3133, Internet – Tofield@schnet.edc.gov.ab.ca e-mail - jmyck@compusmart.ab.ca
DATE OF SUBMISSION	November 1995

INTEGRATED PROJECT 9: “STORE FRONT” SCHOOL

CURRICULUM CORRELATION	Career Transitions, Construction Technologies, Enterprise and Innovation, Art
PROJECT DESCRIPTION	A “Store-Front” school in downtown Okotoks operates as a business where students become involved and offer products and services to members of the community.
STEPS IN THE PROCESS	1. A business proposal is presented by a student(s) to the “Store” Committee 2. Upon acceptance of the proposal, the student team becomes involved in all aspects of the business including the operation of the “store” 3. Local business people are involved in helping the students with all areas of the process 4. Part of the profit of an individual product must go towards the costs of running the business.
PARAMETERS	Varies with each product developed
TARGET AUDIENCE	Students from Grades 10–12
RESOURCES NEEDED	Varies
CONTACT	Foothills Composite High School, Okotoks, Alberta Telephone: 403–938–6116, Fax: 403–938–7365
DATE OF SUBMISSION	October 20, 1995

INTEGRATED PROJECT 10: DESIGN BRIEFS FOR FURNITURE AND CABINET WORK

CURRICULUM CORRELATION	Career Transitions, Construction Technologies, Design Studies
PROJECT DESCRIPTION	Students are involved in designing and constructing furniture and cabinets.
STEPS IN THE PROCESS	1. Identify the problem (project) 2. Research of materials, joining and finish to be used 3. Prepare design brief 4. Construction of the piece 5. Evaluation of the piece from a design standpoint
PARAMETERS	• 3 modules of time • Construction Technology lab • Drafting equipment or ACAD
TARGET AUDIENCE	Grades 10–12
RESOURCES NEEDED	Depends on the project
CONTACT	Jim Jones, Foothills Composite High School, Okotoks, Alberta Telephone: 403–938–6116, Fax: 403–938–7365
DATE OF SUBMISSION	October 20, 1995

INTEGRATED PROJECT 11: BUILDING GARDEN FURNITURE AND SHEDS FOR SALE

CURRICULUM CORRELATION	Construction Technologies, Financial Management, Information Processing
PROJECT DESCRIPTION	Construction students build garden furniture and sheds and then sell them at cost to teachers and staff.
STEPS IN THE PROCESS	1. Determine items to be built, materials required and costs 2. Build furniture and sheds in CT (Framing Systems modules) 3. Prepare advertising materials and coordinate sales
PARAMETERS	• 1 module of time • Construction Technology lab required • Computer and printer
TARGET AUDIENCE	Senior High
RESOURCES NEEDED	Supplies depend upon the project
CONTACT	Derek Schlosser, Hilltop High School, Whitecourt, Alberta Telephone: 403–778–2446, Fax: 403–778–8818
DATE OF SUBMISSION	October 19, 1995

INTEGRATED PROJECT 12: PORTRAITS

CURRICULUM CORRELATION	Communication Technology, Enterprise and Innovation
PROJECT DESCRIPTION	Students in Photography class set up a business in the school doing portraits.
STEPS IN THE PROCESS	1. Set up photography class (20 students in Introductory Photography) 2. Four students open "Photo Club" and purchase equipment 3. Set up business in school and take portraits
PARAMETERS	• One module (approximately 25 hours) • Medium format equipment • Darkroom
TARGET AUDIENCE	Senior High Students
RESOURCES NEEDED	• Film • Processing materials
CONTACT	Derek Schlosser, Hilltop High School, Whitecourt, Alberta Telephone: 403–778–2446, Fax: 403–778–8818
DATE OF SUBMISSION	October 19, 1995

INTEGRATED PROJECT 13: "DESIGN PLAN BOOKLET"

CURRICULUM CORRELATION	Career Transitions, Construction Technologies, Design Studies, Fabrication Studies
PROJECT DESCRIPTION	"Design Plan Booklet" enables students in Construction and Fabrication modules to design a project they then build or fabricate.
STEPS IN THE PROCESS	1. Students in Construction and Fabrication follow design procedures to design a product 2. Students complete project designed 3. Successful completion of a minimum of five projects.
PARAMETERS	• Construction Lab or Fabrication Lab • Module DES2020-3D Applications • Five project modules in Career Transitions focused on Construction or Fabrication
TARGET AUDIENCE	Introductory, Intermediate and Advanced level modules in Construction and Fabrication
RESOURCES NEEDED	• "Design Plan" Booklets • Design supplies • Supplies required for the project
CONTACT	Fred Smith, Lester B. Pearson High School, Calgary, Alberta Telephone: 403–280–6565, Fax: 403–299–7158
DATE OF SUBMISSION	October 20, 1995

INTEGRATED PROJECT 14: SCHOOL NEWSLETTERS AND SCHOOL NEWSPAPERS

CURRICULUM CORRELATION	Communication Studies (Module COM1030), Information Processing
PROJECT DESCRIPTION	Students prepare school newsletters and school newspaper in CTS classes.
STEPS IN THE PROCESS	1. Taking pictures, gathering information 2. Word processing the information 3. Planning and setup of layouts 4. Review and approve draft 5. Final product is distributed
PARAMETERS	• Time - 2/3 hours per week • Computer lab • Desktop publishing software • Digital camera • Printer (gray scale?)
TARGET AUDIENCE	Junior high students (family and community)
RESOURCES NEEDED	• Photography supplies - film, etc. • Paper supplies
CONTACT	Malcolm Fedoretz, Thickwood Heights School, Fort McMurray, Alberta Telephone: 403-743-8417, Fax: 403-791-6811
DATE OF SUBMISSION	October 31, 1995

INTEGRATED PROJECT 15: ENVIRONMENTAL FASHION SHOW

CURRICULUM CORRELATION	Communication Technology, Cosmetology Studies, Design Studies, Energy and Mines, Enterprise and Innovation, Fashion Studies, Financial Management, Foods, Information Processing, Management and Marketing, Music
PROJECT DESCRIPTION	A fashion show with a recyclable approach which incorporates the above strands.
STEPS IN THE PROCESS	1. Gather information from Energy and Mines (Fundamentals of Recycling) 2. Collaboration of information with Fashion Studies to develop a line of clothes 3. Involve other strands to contribute to the final production, i.e. • Foods (to supply refreshments) • Cosmetology Studies (to prepare the models) • Design Studies (to design the back props)
PARAMETERS	• Time estimate – 50 hours • Gymnasium must be booked
TARGET AUDIENCE	Junior High students
RESOURCES NEEDED	• Recyclable materials • Supplies for refreshments • Materials for back props • Paper supplies for tickets, programs, etc.
CONTACT	Tamara Chervin, Timberlea Public School, Fort McMurray, Alberta Telephone: 403–743–5771, Fax: 403–791–5771
DATE OF SUBMISSION	

INTEGRATED PROJECT 16: PANEL DISCUSSION ON GLOBAL ISSUES IN AGRICULTURE

CURRICULUM CORRELATION	Agriculture, Social Studies
PROJECT DESCRIPTION	Linking "Global Issues in Agriculture" with Social Studies 8 Topic C "Brazil"
STEPS IN THE PROCESS	1. CTS students complete MLEs 2. Grade 8 students complete Topic C with some emphasis being placed on poverty and hunger issues 3. CTS students invited to Grade 8 classroom for Panel Discussion, re: global agriculture issues related to hunger.
PARAMETERS	• Classroom determined by group size for panel discussion
TARGET AUDIENCE	CTS grades 11 and 12 and grade 8 students
RESOURCES NEEDED	• Resources for Agriculture module and for Social Studies
CONTACT	Paul Forestell, County Central High School, Vulcan, Alberta Telephone: 403–485–2223, Fax: 403–485–2959
DATE OF SUBMISSION	November 1995

INTEGRATED PROJECT 17: INVESTIGATING MINERALS AND THEIR FORMATION

CURRICULUM CORRELATION	Energy and Mines, Science
PROJECT DESCRIPTION	Combine "Overview of Alberta Geology" module from Energy and Mines with Science 8 study of the Earth's geology to investigate minerals and their formation.
STEPS IN THE PROCESS	1. Lab activities re identification 2. Conclusions reached.
PARAMETERS	• Partial fulfillment (5 hours) of Modules ENM101
TARGET AUDIENCE	Junior High Science students
RESOURCES NEEDED	• Rock and mineral samples • Lab equipment
CONTACT	Malcolm Fedoretz, Thickwood Heights School, Fort McMurray, Alberta Telephone: 403–743–8417, Fax: 403–791–6811
DATE OF SUBMISSION	November 1995

INTEGRATED PROJECT 18: ALTERNATIVE ENERGY SOURCE VEHICLE

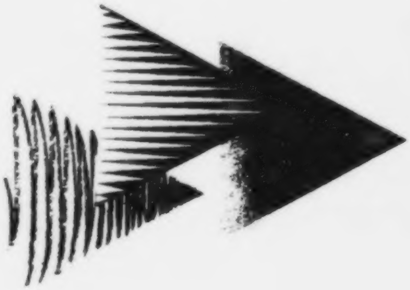
CURRICULUM CORRELATION	Design Studies, Energy and Mines, Fabrication Studies
PROJECT DESCRIPTION	ENM2050 "Renewable Energy Technology" links with appropriate Design Studies and Fabrication Studies modules to produce an "Alternative Energy Source Vehicle."
STEPS IN THE PROCESS	1. Three students or groups of students in each of the modules work together through the modules, or one student works through the three modules 2. Work results in design proposal 3. Vehicle is built as designed 4. Testing of vehicle takes place
PARAMETERS	• Design lab • Fabrication shop
TARGET AUDIENCE	High school students
RESOURCES NEEDED	• This will be determined by the design of the vehicle
CONTACT	Malcolm Fedoretz, Thickwood Heights School, Fort McMurray, Alberta Telephone: 403–743–8417, Fax: 403–791–6811
DATE OF SUBMISSION	November 1995

INTEGRATED PROJECT 19: CONSTRUCTION OF A TYPICAL SATELLITE/WELL-SITE GATHERING FACILITY

CURRICULUM CORRELATION	Energy and Mines, Fabrication Studies
PROJECT DESCRIPTION	The students of both courses work together to construct a typical satellite/well-site gathering facility or mock well-site at school.
STEPS IN THE PROCESS	1. Students discuss the problem and possible solutions 2. Prepare design plans 3. List supplies and equipment 4. Construction of the facility 5. Evaluation of finished product
PARAMETERS	• Project takes one month • Welding equipment, pipefitting equipment, storage tanks, water separator, etc.
TARGET AUDIENCE	Grades 10 and 11students
RESOURCES NEEDED	• Industry support for use of old equipment that students can access
CONTACT	
DATE OF SUBMISSION	October 31, 1995

INTEGRATED PROJECT 20: STUDENTS SET UP THEIR OWN RESOURCE COMPANY

CURRICULUM CORRELATION	Energy and Mines, Management and Marketing
PROJECT DESCRIPTION	Students from Energy and Mines become involved in marketing fundamentals and market trends directly related to energy resources (oil, gas, etc.).
STEPS IN THE PROCESS	1. Students set up their own resource company 2. Make decisions about managing assets and resources based on trends of the market 3. Carry on project for 1 - 2 month period 4. Evaluate success of managing assets, resources
PARAMETERS	• Internet access to global information • Access to JET (Petroleum Industry on-line Information system (1–800–0GJINFO)).
TARGET AUDIENCE	Grades 11 and 12 students
RESOURCES NEEDED	
CONTACT	
DATE OF SUBMISSION	October 31, 1995



CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 5:

Strategies for Implementing CTS

August 1997 (Interim)

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PURPOSE

This document is designed to assist school and systems administrators to implement CTS by outlining basic processes and providing sample support materials.

CTS Team
August 1997

Questions or comments about this document are welcomed and should be directed to:]

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education,
Devonian Building West, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.
Telephone: (403) 422–4872*, Fax: (403) 422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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Attachment 1: Sample Implementation Plan 6

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STRATEGIES FOR IMPLEMENTING CTS

Implementation of CTS will be different in each school system and school. Effective implementation will be based on a commitment from teachers, counsellors and administrators to consider new options in course design and timetabling. For the first time, schools have the opportunity to design their own courses and to examine relationships between CTS and other complementary or core courses.

Because more decision making is delegated to school systems and schools, and because many of the decisions are quite complex, it is important to begin the planning process early.

Below are eight steps for implementing CTS. Each step is described in detail, often with supporting questionnaires, samples, etc., attached at the back of this document. We encourage you to adapt these implementation strategies to suit your school or system, and to use the attached ideas as needed.

1. Establish a planning team
2. Draft a plan of action
3. Inventory your resources
4. Do market research about needs of your community
5. Identify which strands and modules to offer
6. Identify potential barriers and possible solutions
7. Gain commitments for action and approvals
8. Check progress.

1. Establish a Planning Team

Your planning team will involve key players from the school /system, including administrators, counsellors and teachers, as well as students. It may also involve representation from the community, including parents, business and industry, post-secondary and community organizations. Consider the roles and perspectives of key players, both in the school and in the community. Some players will be involved only at the initial planning level; some will be responsible for the day-to-day implementation of the plan.

Some key players and their roles and perspectives are listed below:

School-based:

- **Teachers** play an essential role in the implementation plan. Encourage teachers from all subject areas to get involved in the planning process. Improved linkages between CTS and other programs, team teaching strategies, shared resources, etc., can enrich the learning experience.
- **Counsellors** provide support for career and occupational guidance and, in many cases, strengthen the link between the school and student/parent goals.
- **School and school system administrators** promote students' opportunities to move from secondary school to productive, positive adult roles. School and school system administrators help determine which CTS strands/modules students will be able to access, and provide instructional expertise, facilities and resources to deliver course sequences in CTS.

Community-based:

- **Parents** have a vested interested in helping students to maximize their potential.
- **Business and industry** offers workplace opportunities for students, now and in the future. People in business and industry have expressed the need for highly skilled, effective employees who have a combination of basic competencies and technical and career-specific skills. Many of these people favour an increased involvement in what and how students are taught, and in helping with the delivery of the curriculum. They are valuable assets on the planning team.
- **Post-secondary representatives** on the planning team ensure coordination of programs and smoother transition between high school and post-secondary programs.
- **Community organizations, professional associations** are also key players on the CTS planning team, as they can encourage community and professional support for CTS initiatives.

Once a CTS planning team has been established, members should create a vision statement and set goals. It is important that time be allocated for these tasks, but it is also important that once general agreement is reached, the team moves on to preparing the actual implementation plan.

2. *Draft a Plan of Action*

Define *what* you expect to achieve (deliverables), *when* you intend to achieve these outcomes, and *how* you intend to achieve them (responsibilities, resource needs).

> *Attachment 1* provides a Sample Implementation Plan. This plan, developed by the County of Strathcona, includes Indicators of Success, which you may wish to refer to later in the process.

It is important early in the planning stages to get a sense of system-level decisions:

- what degree of flexibility will be delegated to schools
- what the different schools in the system will be able to consider offering
- what types of funding allocations to schools the system should consider
- what inservice coordination is offered by the system
- how schools can plan together to deliver CTS courses; e.g., junior high schools working with senior high schools to ensure breadth of offerings and seamless transitions.

School-level decisions may involve the following, within the system context outlined above:

- what CTS courses the school will offer:
    - 3-, 4-, 5-, or 6-credit courses
    - cross-strand possibilities
    - advanced level credits for diploma requirements
    - alternative delivery strategies
- the flexibility the school is prepared to allow, keeping in mind:
    - the flexibility of the Carnegie Unit
    - alternative delivery strategies
    - "comfort level" of teachers in handling alternative delivery strategies
    - the rules for determining student marks
    - a method for banking student modules (marks and credits)
- the counselling structures and practices in place to assist students in making the best decisions regarding entry into post-secondary programs or the workplace.

In your planning, keep in mind these pointers:

- phase in your plan, take one step at a time
- too much too fast is a recipe for:
    - failure
    - problems
    - stress
    - frustration
- keep all players informed of progress.

3. *Inventory Your Resources*

As part of your implementation plan, you will need to consider your resources. A system inventory would include the following:

- what are the system's capabilities:
    - facilities and equipment
    - current and potential off-campus delivery sites
    - teacher training in CTS areas
    - teacher inservice programs
- what student scheduling and marks/reporting procedures are in place
- present school system policy for the distribution of funds to schools.

Prepare a profile of your school and community, identifying the available resources that can be best targeted to meet student needs. Identify the *physical* and *human* resources that are or may be available now, both on and off campus. A school/community profile would include the following:

- what program demands exist:
    - past student enrollment in CTS-related courses, within the district and in individual schools, and current student/parent interest in CTS-related courses.
- what did students do when they left school?
    - workplace (type of job)?
    - post-secondary program?
- what courses did they find most useful?
- what courses did they wish they had taken?
- what competencies do students think they need to develop to be successful in junior and senior high?
- what competencies do teachers, administrators, parents, community members, and business people think students need to develop?

Attachment 2 provides a Sample School/Community Profile. *Attachment 3* is a Sample Community Survey, adapted from the County of Lacombe Agriculture Committee, which surveys potential community participants for their interest in becoming involved with local school programs.

4. Do Market Research

Survey student and parent interest in the various CTS strands. You may want to include in your questionnaires references to all the strands or only those strands that you can potentially offer.

> *Attachment 4* is a Sample Student Interest Survey, which you could use to determine the local interest in CTS strands and modules. These survey instruments may be adapted for use with parents and the community.

This is a good time to summarize the results from your inventories and the responses to the surveys.

5. Identify Strands/Modules to Offer

No one school will offer all the strands and all the modules in CTS. In order to meet the needs of most students, schools will need to target certain strands and modules for delivery on campus. It is useful to consider the following:

- which strands/modules are already being delivered (equivalent)?
- why are we offering the present selection of courses?
- do students and the community view the offerings as relevant?
- whose needs are primarily being served? Students? Staff?
- which new strands/modules could be made available to students if present and potential school- and community-based resources were accessed?
- what are the facility guidelines of the proposed strands/resources?
- what are the equipment guidelines of the proposed strands/resources?
- what are the teacher competency guidelines and inservice needs?

> Consult the *CTS Manual for Administrators, Counsellors and Teachers* for information on individual strands, module parameters, and delivery and timetabling strategies. Remember that most CTS modules can be implemented by teachers in present labs. Individual or small group student needs may need to be met through off-campus experiences, arrangements with neighbouring schools, distance learning technologies or individual learning plans.

6. Identify Potential Barriers/Possible Solutions

The barriers that may affect the implementation of CTS are unique to each school/system, as are the types of effort/resources that need to be directed toward resolving the barriers. Barriers may include:

- program credibility within the school and the community (acceptance by community/parents / students that these programs lead to positive career options)
- access to resources (teaching expertise, facilities, equipment, purchase of instructional materials, etc.).

7. Gain Commitments for Action/Approvals

The broader the base of support for CTS, the more likely the program will be implemented successfully. It is recommended that commitments for action and approvals be obtained from all players, particularly teachers, principals and school system administrators.

Ongoing, well-timed communication with the key players increases local support for the actions taken at the school/school system level to implement CTS, thus improving the chances for successful implementation.

8. Check Progress

Take the time to refer to your original goals outlined in your Plan of Action. Review the indicators of success (see Attachment 1).

Attachment 1

Sample Implementation Plan*

A. Objective:

Ensure that all staff affected have received appropriate inservice.

	ACTION	ASSIGNED TO	START DATE	DATE DUE	DATE COMPLETED
1.	Organize a one-day conference that encompasses general and subject-specific topics				
2.	Ensure that course materials being developed are distributed at every opportunity to CTS teachers				
3.	Encourage teachers to assess and if necessary upgrade their technical skills in light of the new courses available				
4.	Encourage teachers to assess and if necessary expand their teaching strategies to accommodate the new courses				
5.	Establish a network of CTS teachers to ensure ongoing communication as issues arise				
6.	Establish an ongoing program of professional opportunities, coordinated centrally, which teachers may access when appropriate				
7.	Ensure that the professional development program dovetails with the county PD model				
8.	Arrange opportunities for teachers to visit other schools that have innovations in equipment, resources, teaching strategies or school organization				

---

* Based on the Implementation Plan for Career and Technology Studies (CTS) developed by the County of Strathcona.

B. Objective:

Establish administrative procedures at the school and system levels to facilitate the implementation of CTS.

	ACTION	ASSIGNED TO	START DATE	DATE DUE	DATE COMPLETED
1.	Inservice key administrators on program delivery possibilities for CTS				
2.	Investigate alternative models of scheduling				
3.	Schedule CTS courses				
4.	Establish a school-based CTS planning process each fall				
5.	Assess such factors as student interest, staff expertise, resources and facilities				
6.	Determine the CTS program for the following school year				
7.	Encourage early field validation of courses and modules, and support teachers who undertake this				
8.	Devise an in-school departmental / coordination structure to reflect the subject integration of CTS				
9.	Ensure ongoing system coordination of CTS				
10.	Monitor program quality to ensure high standards of teaching/learning				
11.	Promote CTS to students and parents, at both system and school level				

C. Objective:

Ensure that all necessary human and material resources are in place.

	ACTION	ASSIGNED TO	START DATE	DATE DUE	DATE COMPLETED
1.	Assess the capital equipment necessary for each course, prior to implementation				
2.	Determine what purchases will be necessary and budget for those items				
3.	Assess necessary modifications to facilities for each course				
4.	Pursue the planning process to implement these changes				
5.	Assess the need for new resource material including written, audio-visual, computer software and other technologies				
6.	Determine what purchases will be necessary and budget for those items				
7.	Investigate the options available to support student-managed learning (SML) or independent learning				
8.	Budget appropriate amounts for the purchase of necessary materials				
9.	Develop test banks for all areas of CTS taught by more than one person				
10.	Scrutinize the developing technologies closely to ensure that all purchases are made considering the latest information				
11.	Ensure that planning for new facilities includes consideration of the latest technologies, and the recommended delivery methods.				

CTS IMPLEMENTATION: INDICATORS OF SUCCESS (Draft)

	Indicators of Success	1 = Not Done	2 = Underway	3 = Done
1.	CTS implementation in the school (and school system) is guided by a long-range plan			
2.	Teachers, counsellors and administrators are knowledgeable about CTS and have incorporated CTS philosophy in the school program			
3.	Teachers are engaged in collaborative planning and support program integration			
4.	Teachers are enhancing their skills to deliver the CTS program			
5.	The school program offers students a choice of CTS strands and supports a wide range of delivery strategies			
6.	Facilities are organized for effective learning and instruction			
7.	Equipment and resources currently available support delivery of CTS modules			
8.	Technology is an integral part of the CTS program and is effectively used by teachers and students			
9.	Students are responsible learners and have opportunities for choice in the CTS program learning activities			
10.	Students demonstrate problem-solving and decision-making skills in their CTS learning activities			
11.	Students' learning activities are appropriate and demonstrate a high standard of achievement			
12.	The community is involved as a meaningful partner in the CTS program.			

Attachment 2

Sample School/Community Profile

A. Student Profile (Primary Client Group)

1. When our students leave school,
    - ____% enter a university
    - ____% enter a technical institute
    - ____% enter a college
    - ____% enter an apprenticeship program
    - ____% enter a workplace
        - ____% retail industry
        - ____% tourism industry
        - ____% agriculture
        - ____% ______________
        - ____% ______________

2. While students attend our school,
    - ____% have firm career plans
    - ____% are planning to go on to post-secondary but have not decided which area
    - ____% are undecided about career plans
    - ____% attend school full-time
    - ____% work part-time and attend school (RELATE TO CTS STRANDS?)
    - ____% work full-time and attend school (RELATE TO CTS STRANDS?)
    - ____% actively participate in extracurricular school activities (RELATE TO CTS STRANDS?)
    - ____% actively participate in club activities (RELATE TO CTS STRANDS?)
    - ____% _____
    - ____% _____
    - ____% _____

3. List competencies students (have already/can gain) outside school:
    - ☐ Driver's Education ________________________________
    - ☐ Computer Literacy ________________________________
    - ☐ Technical Skills ________________________________
    - ☐ Other ________________________________

4. ____% of school population assessing CTS courses (starts/completions) in the 1996-97 year:
    - ____ student enrollments _____ in Business Education
    - ____ student enrollments _____ in Home Economics
    - ____ student enrollments _____ in Industrial Arts
    - ____ student enrollments _____ in Vocational Education
    - ____ student enrollments _____ in Work Experience
    - ____ student enrollments _____ in Other Complementary Courses
    - ____ student enrollments _____ in Career and Technology Studies

B. School Profile

Background

1. Type

☐ K–12
☐ 7–12
☐ 9–12
☐ 7–9
☐ 10–12

2. Location

☐ Rural
☐ Urban

3. Size

☐ Small (fewer than 300 students) please specify
☐ Medium (300–800 students)
☐ Large (800–1200 students)
☐ Extra-large (more than 1200 students)

4. Population by grade

7 ____________________
8 ____________________
9 ____________________
10 ____________________
11 ____________________
12 ____________________

5. Student make-up

☐ Regular students
☐ Special education students
☐ Other ____________________

6. What clubs exist in the school?

7. What major productions take place in the school?

8. On what occasions do parents or school supporters come to the school?

Timetable

1. Period length and frequency:
Senior high: ______ minutes per ________________
_____ Semestered ______ Non-semestered

Junior high:
core course ______minutes per _______________
complementary courses _________ minutes per ________________

2. How are students enrolled in the courses?
______ School placement
______ Student choice

3. Which of the following complementary practical arts programs did you offer in 1996-97?

Junior High	Senior High
_______ agriculture	_______ agriculture
_______ business studies	_______ computer literacy
_______ computer studies	_______ business education (list courses)
_______ home economics	_______ home economics (list courses)
_______ industrial education	_______ industrial education (list career fields)

4. Which CTS strands do you offer?
_______ Agriculture
_______ Career Transitions
_______ Communication Technology
_______ Community Health
_______ Construction Technologies
_______ Cosmetology
__________ Design Studies
_______ Electro-Technologies
_______ Energy and Mines
_______ Enterprise and Innovation
_______ Fabrication Studies
_____ Fashion Studies
_____ Financial Management
_____ Foods
_____ Forestry
_____ Information Processing
_____ Legal Studies
_____ Logistics
_____ Management and Marketing
_____ Mechanics
_____ Tourism Studies
_____ Wildlife

5. How many modules are available? ____

Facilities/Equipment

1. What facilities/equipment does your school have?
_____ TV /VCRs
_____ Computers (how many, what kind?)
_____ Fax
_____ Photocopier
_____ CD Rom
_____ Other AV equipment/facilities
_____ School canteen/cafeteria
_____ Science lab
_____ Sewing lab
_____ Industrial facilities
_____ Cosmetology lab
_____ Other

Human Resources

1. What CTS-related expertise does your staff have (e.g., agriculture, hunter ed, photographic skills)?
   _______ Formal training
   _______ Hobby, interest
   _______ Past experience

2. For each strand/module you are considering offering in your school, have your staff answer fill in the charts provided in Appendix B-5.

C. Community Profile

Note: Gather information from local government (e.g., regional economic development) offices regarding projections from business/industry regarding future economic trends, potential employment opportunities. Find out from post-secondary institutions in the area what programs are offered, and gather some enrollment statistics. Appendix B-6 provides a sample community survey which you may wish to adapt and circulate.

1. Does the school have any community partnerships (e.g., Work Experience, Cooperative Education, Adopt-a-School, RAP and related off-campus programs) at this time?
   _____ No
   _____ Yes. If so, list them:

   ____

   ____

   ____

2. How extensive are opportunities for community partnerships?
   ____ Limited
   ____ Some
   ____ Extensive

3. Are community resources incorporated into the school program?
   _____ No
   _____ Yes. If so, list them:

   ____

   ____

   ____

Attachment 3

Sample Community Survey 1

Name: ______________________________ Telephone: ____________________

Address: ____

Business: ____

Check off one or more of the following to indicate how willing you would be to help students from (name of school) learn on a voluntary basis.

_____ I will welcome students supervised by a teacher to visit my business/organization and I will be available to conduct the tour. A responsible member of the business/organization may also be utilized. NOTE: Arrangements would be made in advance by you and the classroom teacher.

_____ I am willing to speak directly to a class on the production or process involved in my business, or other area of the industry with which I am familiar. Options include videos, slides, brochures, or other materials in presentations. NOTE: Arrangements would be made in advance by you and the classroom teacher.

_____ I am willing to provide information to a teacher by telephone or in person regarding the business/industry that I am involved with.

_____ Our company/organization would be willing to consider forming a partnership with the school or with a program area of the school (e.g., CTS, Humanities, Math, Science, Fine Arts, Phys Ed).

_____ Our company/organization would be willing to:
- _____ provide resources
- _____ sponsor students

_____ I do not want to be involved.

1. Please indicate below the areas of your expertise that you would be willing to convey to students.

____

____

____

2. Please include a brief description of your business/organization along with number of employees.

____

____

____

Attachment 4

Career and Technology Studies

Student Interest Survey

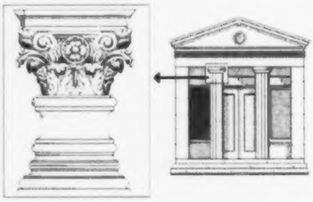
CTS -- Career and Technology Studies -- is the new program for students in junior and senior high school. In 1997, it replaced all of the courses now offered as practical arts. But it's more than an updated practical arts. It's the wave of the future.

You will be able to apply what you learn in CTS in your own life right away. CTS will also help you figure out what you want to do in the future. Modules in the intermediate and advanced levels emphasize career exploration and preparation, helping you determine what is beneficial for you to build the competencies you need to get a job or continue your education in a related post-secondary program.

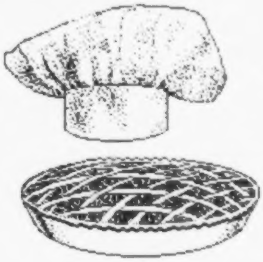
CTS = Personal Use + Career Exploration + Career Preparation

Whether a student wants to be a computer guru,

or a designer,



or a master chef,



CTS is a good idea. **For now, and for the future.**

You can help your school decide what CTS strands to offer. Fill in the chart and hand it over to your school's principal. Your school will be better able to determine which strands are of most interest to the students, parents and community.

CTS Strand	Examples of Related Occupations*	Very Interested	Somewhat Interested	Not Interested
Agriculture	Agriculturalist, Fieldman, Floral Designer, Greenhouse Operator, Writer, Scientist, Farmer, Auctioneer, Cattle Buyer, Landscaper, Horse Trainer, Veterinarian			
Career Transitions	Supports other strands and supports off-campus learning programs and experiences			
Communication Technology	Writer, Photographer, Radio/Television Personality, Sales Person, Printer, Desktop Publisher, Journalist, Animator			
Community Health	Social Worker, Nurse, Dental Assistant, Doctor, Day Care Operator, Physiotherapist, Nursing Home Administrator, Lab Technician			
Construction Technologies	Engineer, Carpenter, Contractor, Architect, Building Inspector, Draftsman, Instructor, Home Handyman, Electrician, Roofer, Plumber, Estimator, Installer, Millright			
Cosmetology	Salon Owner, Hairstylist, Theatrical Makeup Artist, Esthetician, Sales Consultant			
Design Studies	Architect, Designer, CADD, CAM, Photographer, Engineer, Estimator, Product Designer			
Electro-Technologies	Engineer, Instructor, Electrician, Computer User, Robotics Engineer, Designer			
Energy & Mines	Environmentalist, Engineer, Chemist, Mechanic, Technician, Safety Supervisor, Geologist, Service Station Leasee			
Enterprise & Innovation	Entrepreneur, Fund Raiser, Event Planner, Sales Consultant, Manager, Business Owner, Marketer			
Fabrication Studies	Millwright, Welder, Iron Worker, Engineer, Technologist, Designer			
Fashion Studies	Display, Theatre or Fashion Designer, Manufacturing Manager, Retail/Wholesale Buyer, Dressmaker, Tailor			
Financial Management	Manager, Business Owner, Bookkeeper, Credit/Loans Manager, Accountant			
Foods	Chef, Dietitian/Nutritionist, Banqueting/Catering Supervisor, Purchasing Manager, Baker, Butcher/Meat Cutter			
Forestry	Forest Ranger, Environmental Engineer, Biologist, Forest Technologist, Land Surveyor, Logging/Silviculture Worker, Outdoor Guide			
Information Processing	Word Processor, Administrative Support, Computer Programmer, Office Manager, Systems Analyst			
Legal Studies	Lawyer, Law Enforcement, Officer, Legal Assistant			
Logistics	Air Traffic Controller, Bus Driver, Letter Carrier, Messenger, Railway Worker, Transportation Worker			
Management & Marketing	Business Owner, Advertising Consultant, Market Research Analyst, CEO			
Mechanics	Engineer, Motor/Auto Body Mechanic, Aircraft Mechanic, Heavy Industrial Equipment Operator/Mechanic			
Tourism Studies	Travel Consultant, Historical Interpreter, Tour Guide, Hotel Manager			
Wildlife	Fish & Wildlife Officer, Park Ranger, Biologist, Environment Engineer, Veterinarian, Trapper/Hunter, Outdoor Guide			

Some occupations would be entry level after high school, some would require post-secondary education and/or considerable work experience.

CAREER & TECHNOLOGY STUDIES

Manual for Administrators, Counsellors and Teachers

Appendix 6:

CTS MODULE PARAMETERS

August 1997 (Interim)

This document was prepared for:

Administrators	X
Counsellors	X
General Audience	
Parents	
Students	
Teachers	X

Program/Level: Career and Technology Studies/Secondary

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Questions or comments about *Delivery Parameters for CTS Modules* are welcome and should be directed to:

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Alberta Education
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Telephone: (403) 422–4872*
Fax: (403) 422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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CTS Module Parameters

Purpose of this Document

This document is a summary of the module parameters defined in the *Guides to Standards and Implementation.*

The information included in this document is designed to assist school and school system administrators and teachers in planning for the delivery of CTS in their schools and communities. This information can be used to:

- decide which strands and modules will be made available to students
- organize for learning, including:
  - selecting appropriate on-campus and off-campus learning sites
  - scheduling facilities/equipment to maximize student access to modules
  - identifying program components and/or entire modules that may be effectively delivered through distance education technologies
- plan for change, including:
  - designing new facilities
  - purchasing new equipment
  - upgrading present facilities and equipment.

While the use of information, communication and multimedia technologies can be a valuable alternative for expanding student access to CTS programs, care must be taken in selecting modules to be delivered by these technologies. Many CTS modules focus on the development of workplace competencies and require students to link theory with practice in practical "real-life" contexts. *These modules, as indicated through the "module parameters", cannot be effectively delivered unless the student has access to hands-on learning, either in a lab or worksite setting.*

Practicing teachers, post-secondary, business and industry representatives and Alberta Education personnel who have consulted with the CTS Team throughout the curriculum development process have provided valuable advice in defining these module parameters.

What Are Module Parameters

Module parameters describe any special circumstances related to the learning environment that should be in place to ensure that students have the resources they need to develop the competencies defined within the module. Where appropriate, potential safety issues are also identified.

Module parameters have been established to assist in decision making as schools implement the CTS program. The CTS curriculum has been designed to increase students' opportunities to access the program. Therefore, only those module parameters that are absolutely necessary have been defined. In general, there are more module parameters defined at the intermediate and advanced levels than at the introductory level. Alternative delivery strategies are acceptable if students can achieve the same level of competence.

These module parameters should be considered for both on-campus and off-campus learning experiences.

There are two types of module parameters:

Specialized facilities and equipment -- specified when necessary to provide students with the tools and facilities they need to develop skills and to demonstrate the competencies specified within the module (usually producing a product or demonstrating a process).

Instructional qualifications -- specified when necessary to ensure the learning environment is safe, students have access to an appropriate level of technical expertise.

This document also identifies which modules provide credentialling opportunities - specified when students have opportunities to acquire additional credentials (e.g., first aid certificate). Refer to Appendix 14

"Credentialling Opportunities in CTS" for additional information on credentialling opportunities available to CTS students.

The module parameters outlined in this document do not include instructional resources. Refer to Section I of the *Guides to Standards and Implementation* for a list of approved learning and teaching resources. Refer to Section B of the *CTS Manual for Administrators, Counsellors and Teachers* for suggested delivery strategies.

How to Use this Document

This document is organized into two sections:

Section A: provides general information about how to use the module parameters and includes summary charts of where modules parameters are defined

Section B: provides more detailed, strand-specific information.

Section A: Program Overview of Module Parameters

Summary of Module Parameters, Chart A.1, provides a summary of which CTS strands:

- recommend specialized facilities and/or equipment
- include additional instructional qualifications
- offer credentialling opportunities
- identify potential safety (risk management) issues.

As many modules in CTS do not require specialized facilities, equipment or additional instructional qualifications, *CTS Without Labs*, Chart A.2, provides information on which strands/modules can be readily delivered in a standard classroom setting.

Expanding Student Access outlines some basic principles for allocating and using facilities and equipment in order to expand student opportunities to access CTS strands and modules.

Safety and Risk Management outlines guidelines for promotion of a safe learning and teaching environment. These guidelines would affect all CTS strands/modules. The recommendations provided in this section are general in nature and do not in any way replace the expert advice required for specific circumstances.

Computer Integration - CTS recognizes the impact and importance of computers in the current learning environment. Students will ***learn about*** computers and ***learn with*** computers. Charts A.3 and A.4 identify strands/modules that recommend computers and computer integration in CTS in more detail.

Section B: Strand Overview of Module Parameters

Several of the CTS strands do not require specialized facilities, equipment or additional instructional qualifications. These are:

- Career Transitions
- Enterprise and Innovation
- Financial Management
- Legal Studies
- Logistics
- Tourism Studies

Each of the following strands has defined one or more module parameter.

- Agriculture
- Communication Technology
- Community Health
- Construction Technologies
- Cosmetology Studies
- Design Studies
- Electro-Technologies
- Energy and Mines
- Fabrication Studies
- Fashion Studies
- Foods
- Forestry
- Information Processing
- Management and Marketing
- Mechanics
- Wildlife

Each strand includes:

- general information on specialized facilities, equipment or additional instructional qualifications targeted to the strand

- a chart summarizing which modules may have recommendation for additional instructional qualifications, credentialling opportunities and specialized facilities and equipment.

Within each chart the following codes are used:

"✓"	**Recommended as necessary to meet the expectations of the modules** – equipment/tools are considered necessary: • for successful delivery of the module to develop one or more of the competencies (module learner expectations) specified in the module • to ensure proper level of safety • to support credentialling opportunities (e.g., articulation with apprenticeship programs.
"O"	**Optional** – equipment/tools are not necessary, but could help student specialized facilities, equipment or additional instructional qualifications.
"C"	Equipment/tools that would be used in a commercial facility (i.e. cafeteria, school store.)
blank	Equipment/tools may be used if available.
"*"	The reader should refer to the *Guide to Standards and Implementation* for additional information on: • additional instructional qualifications • credentialling opportunities.

Instructional Qualifications

Instructional qualifications refer to requirements that may be necessary for delivery of selected CTS modules, over and above regular professional teaching qualifications. For these selected modules in, in addition to a professional teaching certificate, delivery of the selected modules would require:

- a specific credential or certificate recognized by a professional association or by government (e.g., journeyman, Alberta Best Trainer, etc.)
- evidence of successful completion of a specialized training program or equivalent (workshop/course from technical institute, university, CTS Summer Leadership Seminar, etc.).

These qualifications can be:

- *recommended under all conditions* (e.g., high risk to student safety, both within labs and during outdoor learning experiences)
- *recommended under specific conditions,* usually related to the type of equipment of concern for public safety (e.g., the use of power tools or involvement in customer work)
- *recommended under specified conditions* (e.g., related to potential for students to qualify for a credential). Note: In many instances, students can successfully complete a module without attaining the credential which may be linked to the module.

Additional instructional qualifications are identified in the following strand charts (Section B) and described in more detail in the *Guides to Standards and Implementation* for each strand.

Chart 1: Summary of Strand Module Parameters

Strand	Specialized Equipment	Specialized Facilities	Additional Instructional Qualifications
Agriculture	All except AGR1010, 1090, 1110, 2090, 3010, 3090, 3100, 3130	All except AGR1010, 1060, 1090, 1110, 2050, 2090, 3010, 3050, 3090, 3110, 3130	None recommended
Career Transitions			
Communication Technology	All except COM1020, 1030, 2020, 2030, 3010, 3020, 3030	All except COM1020, 1030, 2020, 2030, 3020, 3030	
Community Health	CMH1060, 2060, 3060	CMH1060, 2060, 3060	CMH1040, 2060, 2070, 2120, 2130, 3060, 3120, 3130
Construction Technology	All except CON2190, 3080, 3110	All except CON2010, 2190, 3080, 3110	All modules
Cosmetology Studies	All except COS1010, 1020, 1050, 1070, 1080, 2010, 2150, 2160, 2180, 2190, 2210, 3100, 3150, 3280	All except COS1010, 1020, 1050, 1070, 1080, 2010, 2150, 2160, 2180, 2190, 2210, 3100, 3150, 3280	All except COS1010, 1020, 1050, 1060, 1070, 1080, 2010, 2120, 2130, 2140, 2150, 2160, 2170, 2180, 2190, 2210, 3010, 3020, 3140, 3150, 3190, 3200, 3210, 3220, 3230, 3240, 3250, 3260, 3280
Design Studies	All except DES2060, 3170, 3180	All except DES2060, 3170, 3180	
Electro-Technologies	All except ELT1050	All except ELT2050, 2060, 2070, 2080	All except ELT3170, 3180
Energy & Mines	All except ENM1090, 1100, 2010, 2080, 2100, 3010, 3050, 3080, 3100	All except ENM1010, 1100, 2010, 2080, 2100, 3010, 3050, 3080, 3100	
Enterprise & Innovation			
Fabrication Studies	All except FAB2020	All except FAB2020	All modules
Fashion Studies	FAS1030, 1040, 1050, 1060, 1070, 2030	All except FAS1010, 2010, 2020, 2140, 3010, 3020, 3070, 3140	
Financial Management	FIN2040, 3010, 3020, 3030, 3040, 3060, 3070		
Foods	All modules	All modules	FOD3090: other modules when offered in a commercial context
Forestry	FOR1020, 1040, 1050, 1060, 1090, 2040, 2060, 2070, 2100, 2120, 3060, 3090, 3110	FOR1040, 1050, 1060, 1090, 2040, 2060, 3090, 3110	FOR1040, 2040
Information Processing	All modules	All modules	
Legal Studies			
Logistics			

Strand	Specialized Equipment	Specialized Facilities	Additional Instructional Qualifications
Management & Marketing	Recommended in MAM1030, 2050, 2060, 2080, 3070, 3080, 3090		
Mechanics	All modules	All except MEC3010, 3080	Required in MEC2020, 2100, 2110, 2150, 2160, 3100, 3110, 3130, 3180, 3190
Tourism Studies	Access to food facility required for TOU1040, 2040	Access to food facility required for TOU1040, 2040	
Wildlife	WLD1010, 1020, 1030, 1050, 2020, 2030, 2040, 2060	WLD1030, 1070, 1080, 2030, 2070, 3040	Required in WLD1030, 1070, 1080, 2030, 2070

Chart 2: CTS without Labs

Many CTS modules can be delivered in a regular classroom. The following chart has been prepared to assist schools in determining which CTS modules they may be able to offer in a regular classroom setting without any special equipment.

Note that in order to meet the curriculum and assessment standards for a module, it may be necessary for the students to be able to take part in field trips. Furthermore, it is expected that appropriate learning and teaching resources and materials would be available, including access to computer workstations and appropriate software.

STRAND	Introductory Level	Intermediate Level	Advanced Level
Agriculture	AGR1010, 1060, 1090, 1110	AGR2050, 2090	AGR3010, 3050, 3090, 3110, 3130
Career Transitions	CTR1010, 1020, 1110, 1120, 1210	CTR2010, 2020, 2030, 2110, 2120, 2130, 2140, 2150, 2210	CTR3010, 3020, 3030, 3110, 3120, 3130, 3140, 3150, 3210
Community Health	CMH1010, 1040, 1050, 1080	CMH2010, 2020, 2030, 2050, 2070, 2080, 2090, 2100, 2110, 2120, 2130	CMH3010, 3020, 3030, 3040, 3050, 3070, 3080, 3090, 3100, 3110, 3120, 3130, 3140
Construction Technologies		CON2010, 2190	CON3080, 3110
Design Studies		DES2060	DES3170, 3180
Electro-Technologies	ELT1050	ELT2050, 2060, 2070, 2080	ELT3100, 3110
Energy & Mines	ENM1010, 1100	ENM2010, 2080, 2100	ENM3010, 3050, 3080, 3100
Enterprise & Innovation	ENT1010, 1020	ENT2010, 2020, 2030, 2040	ENT3010, 3020
Fabrication Studies		FAB2020	
Fashion Studies	FAS1070	FAS2010, 2020, 2040, 2140	FAS3010, 3070, 3140
Financial Management	FIN1010, 1020, 1030	FIN2010, 2020, 2030, 2050	FIN3010, 3020, 3030, 3040, 3060, 3070
Forestry	FOR1010, 1020, 1100	FOR2010, 2030, 2070, 2100, 2120	FOR3010, 3060, 3070, 3080, 3120
Legal Studies	LGS1010, 1020	LGS2010, 2020, 2030, 2050	LGS3010,3020, 3040, 3050, 3060, 3070, 3080
Management & Marketing	M&M1010, 1020, 1030	M&M2010, 2020, 2030, 2040, 2060, 2080	M&M3010, 3020, 3030, 3040, 3050, 3060, 3080
Mechanics			MEC3010, 3080
Tourism Studies	TOU1010, 1020, 1030, 1040, 1050, 1060, 1070	TOU2010, 2050, 2060, 2070, 2080, 2090, 2100	TOU3030, 3040, 3050, 3060, 3080, 3090, 3100, 3110
Wildlife	WLD1010, 1020, 1050	WLD2020, 2040, 2060, 2090	WLD3020, 3050, 3060, 3090

Computer Integration in CTS

Computer Integration: CTS recognizes the impact and importance of computers in the current learning environment. CTS students will ***learn about*** computers and then apply their competencies to ***learn with*** computers.

Students ***learn about*** computers in the Information Processing strand. They learn about the technology, how to enter data and use a wide range of productivity software packages as well as program the computer. They also learn about computers in the Electro-Technologies strand. They learn how to disassemble, assemble and troubleshoot computers, how to examine boards, disk operating systems and computer networks, how to program micro processors, write and execute programs and interface computers with real world devices.

In all CTS strands, as in other courses, students will benefit if they can ***learn with*** a computer, using the technology as a tool to enhance learning. In strands such as Financial Management, Design Studies and Fashion Studies, students must use the computer as a tool to develop the competencies specified in the module.

The following chart provides an overview of how computers are integrated into the CTS strands:

Chart 3: Recommended Access to Computers

Strand	Learning With Computers: Recommended
Agriculture	
Career Transitions	CTR1010, 2010, 3010
Communication Technology	COM1080, 2120, 3130
Community Health	
Construction Technologies	
Cosmetology Studies	
Design Studies	DES1050, 2030, 3100
Electro-Technology	ELT3070, 3080, 3090
Energy & Mines	
Enterprise & Innovation	
Fabrication Studies	FAB2150, 3150
Fashion Studies	FAS2030, 3020
Financial Management	FIN2040
Foods	
Forestry	
Information Processing	All modules
Logistics	All modules
Legal Studies	
Management & Marketing	M&M1030, 1040, 2050, 2060, 2070, 3070, 3080, 3090
Mechanics	MEC3090
Tourism Studies	
Wildlife	

Chart 4: Optional Access to Computers

Strand	Learning With Computers: Optional
Agriculture	All modules
Career Transitions	
Communication Technology	All modules
Community Health	
Construction Technologies	CON1120, 2200, 3080, 3110, 3190, 3200
Cosmetology Studies	
Design Studies	All modules
Electro-Technology	All modules
Energy & Mines	All modules
Enterprise & Innovation	ENT1020
Fabrication Studies	FAB1160, 2010, 2020, 3010
Fashion Studies	
Financial Management	FIN2050, 3010, 3020, 3030, 3040, 3050, 3060, 3070
Foods	FOD2010, 2020, 2030, 3010
Forestry	All modules
Information Processing	All modules
Legal Studies	
Logistics	
Management & Marketing	All modules
Mechanics	All modules
Tourism Studies	All modules
Wildlife	All modules

Expanding Student Access to CTS

Students' access to the CTS program can be expanded considerably by efficient use of facilities and equipment and taking advantage of alternative delivery strategies, both on-campus and off-campus. The following suggestions are provided for reviewing and reconsidering how modules can be delivered.

Use of Facilities and Equipment

What courses are presently being offered? (*When making the transition into CTS, it may be possible that a particular facility could support the delivery of modules from strands other than those currently being considered.*)

Which additional modules could be offered:
- in this facility?
- in an adjacent facility?

Is there adequate technical support? (*Teachers who are extensively involved in setting up, maintaining and repairing the technology are often unable to invest sufficient time in organizing for learning, working directly with students and assessing their competencies.*)

Are there alternative facilities/equipment available:
- in the community (e.g., business/industry, central office)?
- through other partners (e.g., neighboring schools/school systems, post-secondary institutions)?

If considering the construction of new facilities or renovations to existing facilities, contact the School Finance and Facilities Branch (427-2988), Alberta Education, for guidelines on developing facilities to support CTS.

Additional information that may be useful when designing new CTS facilities or planning renovations to present facilities is provided in the *CTS Manual for Administrators, Counsellors and Teachers* (see Section B and Appendix 10).

Use of Distance Education Technology

The use of information, communication and multimedia technologies can be another effective means of expanding access to a range of relevant CTS modules for all students.

Could distance education technologies be used to:
- help students learn difficult concepts?
- deliver instruction in new areas where there may be a lack of teacher expertise?

While distance education can be a valuable alternative for expanding student access to some CTS modules, care must be taken in selecting modules to be delivered by these technologies. Many of the CTS modules focus on the development of workplace competencies and require students to link theory with practice in practical "real-life" contexts. *These modules cannot be effectively delivered unless the student has access to hands-on learning, either in a lab or worksite setting.*

CTS modules particularly suited to effective delivery through distance education technology (i.e., modules that can be offered in a standard classroom without access to specialized facilities/equipment) are identified in the *CTS Manual for Administrators, Counsellors and Teachers* (see Section B, Chart B-2: CTS Without Labs, or Appendix 6, Chart 2: CTS Without Labs).

Strand Overview of Module Parameters*

Agriculture 11
Communication Technology 17
Community Health 23
Construction Technologies 27
Cosmetology Studies 37
Design Studies 49
Electro-Technologies 53
Energy & Mines 67
Fabrication Studies 71
Fashion Studies 81
Foods 83
Forestry 91
Information Processing 97
Management & Marketing 101
Mechanics 107
Wildlife 123

*Only those strands which specify module parameters are included.

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Module Parameters for Agriculture

Facilities

Some modules in the Agriculture scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- a land laboratory and/or outdoor environment
- science, design, construction, fabrication and mechanics laboratories
- controlled growing environments with adequate ventilation suited to plant and/or livestock production
- lighting capabilities conducive to horticulture
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service.

Modules that require access to facilities not present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

An equipment list for each module in the scope and sequence has been provided in the module parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the expectations of the modules.

Equipment for modules in Agriculture can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations

Facilities used to support an Agriculture program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and establish appropriate personal and environmental health and safety procedures in modules that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- practical skills in animal care

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

Instructional Qualifications

Courses in Agriculture can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science, social studies and/or relevant industry (e.g., plant/animal production, animal husbandry, interior/exterior plantscape, floristry, agrifoods, market development, environmental management) will be an asset to those who provide instruction in Agriculture modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies (e.g., Alberta Agriculture, Food and Rural Development).

To ensure compliance with safety and industry standards, some modules require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities

Some modules within the Agriculture strand provide opportunities for students to earn either complete or partial credentials recognized by business, industry and/or post-secondary institutions. Modules that link with credentialling opportunities relevant to the agriculture or horticulture sectors are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

AGRICULTURE

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
THEME	A	B	B	B	B	B	B	C	A	B	B	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS																
INSTRUCTIONAL FACILITIES		•		•	•		•		•	•	•		•	•	•	
CREDENTIALLING OPPORTUNITIES										•	•		•			
EQUIPMENT	Agriculture: The Big Picture	Production Basics	Consumer Products & Services	Basic Landscape/Turf Care	Basic Floral Design	Marketing Fundamentals	Agriculture Technology	Resource Management	Animal Husbandry/Welfare	Field Crops 1	Livestock/Poultry 1	Agrifoods 1	Landscape/Turf Management 1	Equine 1	Floral Design 1	Marketing 1
	1010	1030	1060	1070	1080	1090	1100	1110	2020	2030	2040	2050	2060	2070	2080	2090
Autoclave										O						
Computers & software (1)				O	O	O	O		O	O	O		O	O	O	O
Floral equipment & materials (2)					✓										✓	
Heating coil & controller		O														
Landscape equipment, hand (3)		O		✓									✓			
Landscape equipment, power (4)				✓									✓			
Lighting equipment (5)		O			✓										✓	
Maps, hydrogeological																
Maps, soil																
Meter, electrical conductivity																
Meters, pH								O								
Microscope		O		✓				O		✓	O	O	✓			
Plant propagation materials (6)		O		✓	✓					✓			✓		✓	

LEVEL	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	B	C	C	B	A	B	B	B	B	B	B	B	B	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS																	
INSTRUCTIONAL FACILITIES	•	•	•	•		•	•		•	•	•		•		•		•
CREDENTIALLING OPPORTUNITIES		•				•	•		•						•		
EQUIPMENT	Protected Structures	Soils Management 1	Integrated Pest Management	Nursrey/Greenhouse Crops 1	Issues in Agriculture	Field Crops 2	Livestock/Poultry 2	Agrifoods 2	Landscape/Turf Management 2	Equine 2	Floral Design 2	Marketing 2	Biotechnology	Water Management	Soils Management 2	Sustainable Agriculture Systems	Nursery/Greenhouse Crops 2
	2100	2120	2130	2140	3010	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Autoclave	O			O		O											O
Computers & software (1)	O			O		O	O	O	O	O	O	O					O
Floral equipment & materials (2)											✓						
Heating coil & controller				O		O											O
Landscape equipment, hand (3)				✓		✓			✓								✓
Landscape equipment, power (4)				O		O			✓								O
Lighting equipment (5)	O			O		O					O						O
Maps, hydrogeological														✓			
Maps, soil		✓													✓		
Meter, electrical conductivity		✓				O									✓		O
Meters, pH		✓				O									✓	O	O
Microscope				✓		O	O	O	O								O
Plant propagation materials (6)		✓		✓		✓			✓						✓		✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

AGRICULTURE

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	B	B	B	C	A	B	B	B	B	B	B	B	B	C	C		A	B	B	B	B	B	B	B	B	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS																																	
INSTRUCTIONAL FACILITIES		•		•	•		•		•	•	•		•	•	•		•	•	•	•		•	•		•	•	•		•		•		•
CREDENTIALLING OPPORTUNITIES										•	•		•					•				•	•		•						•		
EQUIPMENT	Agriculture: The Big Picture	Production Basics	Consumer Products & Services	Basic Landscape/Turf Care	Basic Floral Design	Marketing Fundamentals	Agriculture Technology	Resource Management	Animal Husbandry/Welfare	Field Crops 1	Livestock/Poultry 1	Agrifoods 1	Landscape/Turf Management 1	Equine 1	Floral Design 1	Marketing 1	Protected Structures	Soils Management 1	Integrated Pest Management	Nursrey/Greenhouse Crops 1	Issues in Agriculture	Field Crops 2	Livestock/Poultry 2	Agrifoods 2	Landscape/Turf Management 2	Equine 2	Floral Design 2	Marketing 2	Biotechnology	Water Management	Soils Management 2	Sustainable Agriculture Systems	Nursery/Greenhouse Crops 2
	1010	1030	1060	1070	1080	1090	1100	1110	2020	2030	2040	2050	2060	2070	2080	2090	2100	2120	2130	2140	3010	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Protective clothing (7)		O	O	✓	✓		O		✓	✓	✓	O	✓	✓	✓		O	O	✓	✓		✓	✓	O	✓	✓	✓		O		O		✓
Pruning tools		O		✓	O					✓			✓		✓					✓		O			✓		✓						✓
Refrigerator		O	O	O	✓							O	O		✓					O		O		O	O		✓						O
Riker (permanent display) mounts		O	O	O	O			O		O	O	O	O		O				O	O		O	O	O	O		O						O
Samples: agriculture commodity	✓	✓	✓							✓	✓	✓										✓	✓	✓									
Samples: feed		O							✓		✓			✓									✓			✓							
Samples: fertilizer		O		✓						✓			✓							✓		✓			✓								✓
Samples: pesticide		O		✓				✓		✓			✓				O		✓	✓		✓			✓								✓
Samples: seed		O		O						✓			O							✓		✓			O								✓
Samples: soil				O				O		O			O				O	✓		✓		O			O						✓		✓
Slides/specimens, plant & animal (8)	✓	O	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓					✓		✓	✓	✓	✓	✓	✓						✓
Sprayer, chemical				O						O			O				O		O	O		O			O								O
Tables, media mixing		O		O									O							O					O								O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

AGRICULTURE

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2
THEME	A	B	B	B	B	B	B	C	A	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS														
INSTRUCTIONAL FACILITIES		•		•	•		•		•	•	•		•	•
CREDENTIALLING OPPORTUNITIES										•	•		•	
EQUIPMENT	Agriculture: The Big Picture	Production Basics	Consumer Products & Services	Basic Landscape/Turf Care	Basic Floral Design	Marketing Fundamentals	Agriculture Technology	Resource Management	Animal Husbandry/Welfare	Field Crops 1	Livestock/Poultry 1	Agrifoods 1	Landscape/Turf Management 1	Equine 1
	1010	1030	1060	1070	1080	1090	1100	1110	2020	2030	2040	2050	2060	2070
Tables, seedage		O		O									O	
Water culture containers										O				
Water distiller/deionizer				O						O			O	
Watering equipment (9)		O		✓	✓					✓			✓	
Weigh scales										✓	O			O

LEVEL	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	B	B	B	C	C		A	B	B	B	B	B	B	B	B	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS																			
INSTRUCTIONAL FACILITIES	•		•	•	•	•		•	•		•	•	•		•		•		•
CREDENTIALLING OPPORTUNITIES				•				•	•		•						•		
EQUIPMENT	Floral Design 1	Marketing 1	Protected Structures	Soils Management 1	Integrated Pest Management	Nursrey/Greenhouse Crops 1	Issues in Agriculture	Field Crops 2	Livestock/Poultry 2	Agrifoods 2	Landscape/Turf Management 2	Equine 2	Floral Design 2	Marketing 2	Biotechnology	Water Management	Soils Management 2	Sustainable Agriculture Systems	Nursery/Greenhouse Crops 2
	2080	2090	2100	2120	2130	2140	3010	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Tables, seedage						O					O								O
Water culture containers			O			O		O											O
Water distiller/deionizer				✓		O		O			O					O	✓		O
Watering equipment (9)	✓					✓		✓			✓		✓						✓
Weigh scales				O		✓		✓	O			O					O		✓

(1) Computer software may include breeding records, financial management, design and layout, marketing databases as required.
(2) Floral equipment and materials include glue gun, netting, spray paint, water picks, pins, ribbon, floral foams, tape, knives, floral shears, wire, assorted florals, packaging materials, floral containers.
(3) Hand landscape equipment includes hoe, rake shovel, trowel, spade, wheelbarrow, garden fork.
(4) Power landscape equipment includes aerator, lawn mower, lawn rake, rototiller.
(5) Lighting equipment may include tungsten filament lamps, fluorescent lamps, high intensity discharge lamps and timers as required.
(6) Plant propagation materials include plant pots/containers, growing media, soil amendments, fertilizer, and rooting hormone.
(7) Protective clothing may include rubber/steel-toed boots, gloves, protective eyewear, coveralls, rubber pants and jacket as required.
(8) Slides/specimens may include plant or animal structures, pests and diseases as required.
(9) Watering equipment includes hoses, water sprinklers/sprayers, watering cans.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Communication Technology

Facilities

Some modules in the Communication Technology scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and/or off-campus facilities. These might include:

- storage areas
- water and sinks
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone/data line service
- darkroom(s).

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

The type of facility and equipment required for the Communication Technology strand will be determined by the nature and scope of the program being offered. The current Visual Communication program requires specialized darkroom facilities (including water, fume ventilation and specialized power) and ventilation/power for the printing area. With the advent of digital photography, the darkroom can be viewed as an option, at least at the introductory and intermediate levels of the strand; however, some of the program expectations identified at the advanced level will require a darkroom facility. If the print theme is being taught, there will continue to be a need for specialized ventilation and access to water for cleaning of equipment, as well as a chemical storage cupboard required for inks, solvents, etc..

Equipment

A recommended equipment list for each module in the scope and sequence has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules.

Programs offering audio/video production will require video cameras and one or more editing facilities depending on student demand. Some schools have addressed the audio/video theme with minimal equipment; others have provided full television studio facilities, complete with advanced cameras and state-of-the-art switching and editing capabilities. Some Communication Technology sites are producing programs for their school, system and community, including production for their local cable networks. It may be possible for students to access more advanced equipment and facilities through the community (e.g., local television/radio, printing shops, photography studios, design studios), reducing the need for high end facilities in the school.

Equipment for modules in Communication Technology can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations

Safety and security issues in Communication Technology will depend on the scope of the program provided. Safety with respect to the use of equipment, materials and supplies will be particularly important in photography (e.g., processing chemicals) and print themes (e.g. fumes from printing ink, paper cutters, press and binding equipment). Steps should also be taken to lock up solvents and inks in a fire proof cabinet and to secure power supply through a lockout mechanism.

Instructional Qualifications

Courses in Communication Technology can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom and/or laboratory environments. A background in design, art, English and/or relevant industry will be an asset to those who provide instruction in Communication Technology modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies.

Communication Technology addresses four majors themes: presentation and communication, photography, print, audio/video/digital. Its foundation is the current Visual Communication program; teachers of this program will have much of the background necessary to offer the strand. Teachers of Fine Art, Visual Communication and Industrial Arts may find a transition into Communication Technology relatively easy, as they will have had some experience with the content and the conceptual framework. Communication Technology teachers will require some technical background in one or more of the themes if they are going to teach the program effectively, particularly in the photography, print and audio/video themes. Due to the scope of the program, additional training through university, college or technical schools would be beneficial. Teachers with formal design, photography, audio/video or print graphics training will clearly have an advantage in the related modules.

To ensure compliance with safety and industry standards, some modules require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities

There is a formal articulation to the Graphic Arts Craftsman trade through the printing theme of Communication Technology. While this theme will provide some background for students in the area, there is no opportunity for credentialling within the strand itself.

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Module Parameters Chart

COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2
THEME	A	A	B	C	D	D	D	A	A	A	B
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES	•			•	•	•	•	•			•
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Presentation & Communication 1	Media & You	Photography 1	Printing 1	Audio/Video Production 1	Animation 1	Digital Design 1	Presentation & Communication 2	Media Design & Analysis 1	Script Writing 1	Photography 2
	1010	1020	1030	1050	1060	1070	1080	2010	2020	2030	2040
Audio recorder(s)	✓	✓			✓			✓	O		
Camcorder(s)	✓	✓			✓	O	✓	✓	✓		
Camera (animation)						✓			O		
Camera(s) (still)	✓	✓	✓					✓	✓		✓
CD player		✓					✓	✓	✓		
CD player (photo)	✓	O					✓	O			
CD-Rom player		O					✓		O		
Computer(s)	✓	✓	✓	✓	✓	O	✓	✓	✓	✓	✓
Darkroom & accessories		O	O								✓
Display boards	✓	O	O	✓					O		O
Editing room					O						
Editor		O			O						
Laserdisc player		O					✓		O		
Layout/Drafting table(s)		O		✓					✓		

LEVEL	2	2	2	2	2	2	2	2	2	3	3
THEME	B	B	C	C	D	D	D	D	B	A	A
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Photographic Communication	Photographic Techniques 1	Printing Techniques 1	Printing Applications 1	Audio/Video 1	Audio/Video 2	Animation 2	Digital Design 2	Special Effects Photography	Presentation & Communication 3	Media Design & Analysis 2
	2050	2060	2070	2080	2090	2100	2110	2120	2130	3010	3020
Audio recorder(s)	✓				✓	✓				✓	✓
Camcorder(s)					✓	✓		✓		✓	✓
Camera (animation)							✓			✓	
Camera(s) (still)	✓	✓		O					✓	✓	✓
CD player					✓	✓	✓	✓		✓	
CD player (photo)	✓					✓	✓	✓		✓	✓
CD-Rom player	O						✓	✓			
Computer(s)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Darkroom & accessories	✓	✓	O	O					✓		O
Display boards	O	O	O	O					O	✓	✓
Editing room					✓	✓					
Editor	O				✓	✓	✓				
Laserdisc player	✓					✓		✓		✓	✓
Layout/Drafting table(s)	✓		✓	✓			✓			✓	✓

LEVEL	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	B	C	C	D	D	D	D
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Script Writing 2	Photography3	Photojournalism	Photographic Techniques 2	Colour Photography	Printing Techniques 2	Printing Applications 2	Audio 3	Video 3	Animation 3	Digital Design 3
	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130
Audio recorder(s)								✓			
Camcorder(s)									✓		✓
Camera (animation)									✓	✓	
Camera(s) (still)		✓	✓	✓	✓	✓	✓				✓
CD player								✓	✓	✓	✓
CD player (photo)									✓	✓	✓
CD-Rom player									✓	✓	✓
Computer(s)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Darkroom & accessories		✓	✓	✓	✓						
Display boards		✓	✓	✓	✓					✓	
Editing room									✓		
Editor									✓	✓	
Laserdisc player										✓	✓
Layout/Drafting table(s)				✓	✓	✓	✓			✓	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2
THEME	A	A	B	C	D	D	D	A	A	A
INSTRUCTIONAL QUALIFICATIONS										
INSTRUCTIONAL FACILITIES	•			•	•	•	•	•		
CREDENTIALLING OPPORTUNITIES										
RECOMMEDED EQUIPMENT	Presentation & Communication 1	Media & You	Photography 1	Printing 1	Audio/Video Production 1	Animation 1	Digital Design 1	Presentation & Communication 2	Media Design & Analysis 1	Script Writing 1
	1010	1020	1030	1050	1060	1070	1080	2010	2020	2030
Light table(s)		O		✓		O				
Microphones					O			✓		
Mixer		O			O					
Paper cutter				✓					O	
Photocopier	O			O					O	
Photo enlarger(s)		O	O							
Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Projector (16mm)						✓				
Projector (overhead)	✓	O						✓		
Projector (slide)	✓	O						✓	O	
Recording booth					O			✓		
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screen	✓	O						✓	O	
Screen printing equipment				O						

LEVEL	2	2	2	2	2	2	2	2	2	2
THEME	B	B	B	C	C	D	D	D	D	B
INSTRUCTIONAL QUALIFICATIONS										
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES										
RECOMMEDED EQUIPMENT	Photography 2	Photographic Communication	Photographic Techniques 1	Printing Techniques 1	Printing Applications 1	Audio/Video 1	Audio/Video 2	Animation 2	Digital Design 2	Special Effects Photography
	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130
Light table(s)	✓	✓	✓	✓	✓					✓
Microphones		O				✓	✓			
Mixer		O				✓	✓			
Paper cutter			✓	✓	✓					
Photocopier				O	O					
Photo enlarger(s)	✓	✓	✓							✓
Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Projector (16mm)								✓		
Projector (overhead)										
Projector (slide)	✓	✓								
Recording booth						✓	✓			
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Screen	✓	✓						✓		
Screen printing equipment				O	O					

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	B	B	B	B	C	C	D	D	D	D
INSTRUCTIONAL QUALIFICATIONS													
INSTRUCTIONAL FACILITIES	•			•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES													
RECOMMEDED EQUIPMENT	Presentation & Communication 3	Media Design & Analysis 2	Script Writing 2	Photography3	Photojournalism	Photographic Techniques 2	Colour Photography	Printing Techniques 2	Printing Applications 2	Audio 3	Video 3	Animation 3	Digital Design 3
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130
Light table(s)	✓			✓	✓	O	✓						
Microphones	✓									✓	✓	✓	
Mixer										✓	✓	✓	
Paper cutter		✓			✓	✓	✓	✓	✓				
Photocopier		O						✓	✓				
Photo enlarger(s)		O		✓	✓	✓	✓						
Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Projector (16mm)												✓	
Projector (overhead)	✓											O	
Projector (slide)	✓	✓	✓	✓	✓	✓	✓					O	
Recording booth										✓	✓		
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screen	✓	✓		✓	✓	✓	✓					✓	
Screen printing equipment								✓	✓				

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COMMUNICATION TECHNOLOGY

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Presentation
B. Photography
C. Print
D. Audio/Video/Digital

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2
THEME	A	A	B	C	D	D	D	A	A	A	B
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES	•			•	•	•	•	•			•
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Presentation & Communication 1	Media & You	Photography 1	Printing 1	Audio/Video Production 1	Animation 1	Digital Design 1	Presentation & Communication 2	Media Design & Analysis 1	Script Writing 1	Photography 2
	1010	1020	1030	1050	1060	1070	1080	2010	2020	2030	2040
Special FX generator						○	✓				
Storage cabinet(s)	○	○	✓	✓	✓				○		✓
Tripod/Dolly					✓	✓		○	✓		✓
VCR/Monitors		✓			✓	✓	✓	✓	✓		
Video production room					○						
Work/Animation table(s)		○				✓			✓		

LEVEL	2	2	2	2	2	2	2	2	2	3	3
THEME	B	B	C	C	D	D	D	D	B	A	A
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Photographic Communication	Photographic Techniques 1	Printing Techniques 1	Printing Applications 1	Audio/Video 1	Audio/Video 2	Animation 2	Digital Design 2	Special Effects Photography	Presentation & Communication 3	Media Design & Analysis 2
	2050	2060	2070	2080	2090	2100	2110	2120	2130	3010	3020
Special FX generator					✓	✓		✓			
Storage cabinet(s)	✓	✓	✓	✓	✓	✓	✓		✓		
Tripod/Dolly					✓	✓	✓		✓	✓	
VCR/Monitors	○				✓	✓	✓	○		✓	✓
Video production room						✓					
Work/Animation table(s)			✓	✓			✓			✓	✓

LEVEL	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	B	C	C	D	D	D	D
INSTRUCTIONAL QUALIFICATIONS											
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES											
RECOMMEDED EQUIPMENT	Script Writing 2	Photography3	Photojournalism	Photographic Techniques 2	Colour Photography	Printing Techniques 2	Printing Applications 2	Audio 3	Video 3	Animation 3	Digital Design 3
	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130
Special FX generator									✓	✓	✓
Storage cabinet(s)		✓	✓	✓	✓	✓	✓		✓		
Tripod/Dolly		✓	✓	✓	✓				✓		
VCR/Monitors									✓	✓	✓
Video production room									✓	✓	
Work/Animation table(s)						✓	✓			✓	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Community Health

Facilities

The majority of the Community Health strand can be successfully taught in a classroom/community setting without special facilities. When planning or selecting a facility for Community Health, ensure access to:

- adequate space for instruction
- existing in-school facilities used for science and/or Home Economics (water and sinks)
- relevant business, industry and government facilities available in the community and province
- a resource center that includes computer hardware/software, as well as storage for print and audio-visual material.

Also desirable, though not essential, are classroom facilities that include:

- stoves, washer and dryer
- display and storage areas
- whiteboards/bulletin boards
- telephone service.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules. Teachers will find it desirable to develop a list of small equipment and materials that addresses the needs of specific learning activities planned within each module.

Equipment needs may be addressed through purchasing, borrowing, renting and/or constructing. When choosing among options for obtaining equipment, give consideration to:

- adequacy of budgets for purchase of equipment
- in-school maintenance and storage capabilities
- the logistics and cost of renting
- potential for loan of equipment from other organizations
- joint purchases with other organizations or in-school departments
- opportunities for locally constructing some equipment.

Safety Considerations

Facilities used to support the Community Health program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform. Personal health/safety procedures must be established in modules that involve:

- the handling and storage of hazardous materials
- the proper cleaning and maintenance of equipment and supplies
- practical skills involving client care
- off-campus learning

Students must understand the importance of maintaining and promoting health and safety for themselves and others in all aspects of daily living.

Instructional Qualifications

To facilitate the planning and delivery of an effective Community Health program, it is assumed that the teacher has Alberta certification with instructional expertise and interests in the areas of family studies and/or health care. First aid and health care training/experience and a background in science will be assets in delivering some of the modules especially at the intermediate and advanced levels. Teachers will find it desirable to form partnerships with the first aid and other relevant community agencies.

To ensure compliance with industry and/or safety standards, some modules require that instruction be provided by a person(s) having additional credentials recognized by business, industry, government or community organizations. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Students may earn credentials recognized by business, industry and/or post-secondary institutions by demonstrating specified competencies. Modules that link with credentialling opportunities relevant to Community Health are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

Community Sensitivities
Some topics addressed in the Community Health strand are of a sensitive nature (e.g., human sexuality, dealing with loss). Teachers should adhere to policy as outlined in XX and ensure that parents are aware of the topics to be addressed and, where appropriate, obtain parental permission.

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Module Parameters Chart

COMMUNITY HEALTH

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Sociocultural Perspectives
B. Skills for Caring
C. Health Sciences
D. Injury Prevention

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	D	A	A	A	B	B	C	C	C	C	C	D	D	A	A	A	B	B	B	B	C	C	C	C	D	D
INSTRUCTIONAL QUALIFICATIONS		•				•					•	•					•	•						•						•	•
INSTRUCTIONAL FACILITIES				•							•													•							
CREDENTIALLING OPPORTUNITIES		•				•											•	•					•							•	
EQUIPMENT	Family Dynamics	Caring for Children	Child Development	Home Care 1	Perspectives on Health	Personal Safety	Adolescent Health Issues	Perspectives on Marriage	Community Volunteerism	Day Care 1	Home Care 2	Sensory Challenges	Respiratory System	Circulatory System	Musculoskeletal System	Complementary Therapies	First Aid/CPR	Sports First Aid 1	Family Issues	Parenting	Aging	Prenatal & Postnatal Care	Daycare 2	Home Care 3	Challenged Individuals	Digestion System	Nervous/Endocrine System	Mental Health	Advances in Medical Technology	First Aid/CPR for Children	Sports First Aid 2
	1010	1040	1050	1060	1080	CTR	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130
Baby care items (1)		✓																													
Child's play items and books		O	O							O													O								
Consumables (2)				✓		✓					✓						✓	✓						✓							✓
First aid supplies (3)		✓		O		✓					✓		✓	✓	✓		✓	✓						✓						✓	✓
Fridge		O	O	✓							✓													✓						O	
Hospital furniture (4)				O							✓													✓							
Linens (5)		✓		✓							✓													✓							
Medical personal care items (6)				✓							✓										O			✓							
Models (7)				✓	O						O		O	✓	✓		O	✓				✓		O		✓	✓	O		O	✓
Weighted baby		O	O																	O		O									
Wheelchair				✓							✓						O							✓							

(1) Baby care items include bottles, diapers.
(2) Consumables include gloves, masks, straws, applicators, swabs, bandages, tape, pro-wrap, Tuffskin, Second Skin.
(3) First aid supplies may include blankets, first aid kit, CPR resuci (Anne, Junior, Baby), actor models, stretchers, splints.
(4) Hospital furniture items include hospital bed, bedside tables, overbed table, foot stool crib.
(5) Linens may include pillowcases, blankets, towels, drawsheets, bed protectors, gowns, sheets, pillows, face cloths.
(6) Medical personal care items include urinals, trays, water jug and cups, thermometers, eating aids, hot water bottle, ice packs, forceps and holders, pill containers, oral medical dispensers, stethoscopes, scissors, commode, bath thermaometer, basins, bedpans, soap dish, denture cup, dispenser jars, sphygmenometers.
(7) Models may include pelvic birthing models: skeletal, torso, heart, excretory, skin, brain, fetal, reproduction, joint, kidney.

*** Refer to specific modules listed in sections D, E and F of the corresponding Guide to Standards and Implementation for additional information.**

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Module Parameters for Construction Technologies

Facilities
CTS programs centred around Construction Technologies should include modules that link with a facility and/or building site that is readily available in the school and/or in the community. When selecting or planning a facility for Construction Technologies ensure:

- adequate space for instruction
- ample storage space for materials and projects
- adequate services to run the equipment
- provision for dust collection and fume extraction
- access to water and service doors
- appropriate ambient features that promote learning
- fire protection.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules and equipment that is considered optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for modules in Construction Technologies can be obtained through a combination of procedures such as: purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations
A number of safety issues exist related to the maintenance and use of specialized power equipment, handling and storage of materials and behaviour of students while working in a shop environment. Extra care should be taken to ensure that facilities and equipment are well maintained and that students understand and practice safe work habits at all times. In addition, it is also important to have procedures in place to lock out gas and power service and secure tools and material supplies.

Instructional Qualifications
Due to the nature of the Construction Technologies strand, most modules require some form of specialized training provided primarily by recognized institutions responsible for occupational, technical or teacher preparation. Other forms of specialized training may also be provided through training seminars, workshops and other short courses. However, if a module is to be used to gain advanced standing in an apprenticeable trade, instruction must be provided by a teacher/instructor with journeyman qualifications.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Students may earn credentials recognized by industry and post-secondary institutions by demonstrating a specific set of competencies. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential, specifically related to Explosive Actuated Tool Certification.)

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
INSTRUCTIONAL FACILITIES	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*		*
CREDENTIALLING OPPORTUNITIES																										
EQUIPMENT	Basic Tools & Materials	Building Construction	Project Management	Solid Stock Construction	Turning Operations	Manufactured Materials	Mold Making & Casting	Site Preparation	Concrete Forming	Alternative Foundations	Framing Systems 1	Roof Structures 1	Exterior Finishing	Electrical Systems	Plumbing Systems	Climate Control Systems	Agri-Structures	Multiple Materials	Furniture Making 1	Furniture Making 2	Finishing & Refinishing	Cabinetmaking 1	Cabinetmaking 2	Wood Forming	Manufacturing Systems	Product Development
	1010	1070	1120	1130	1140	1160	1180	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2120	2130	2140	2150	2160	2170	2180	2190	2200
Basic set of hand tools (1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Bench, equipment	O	O	✓	✓	✓	✓	✓											✓	✓	✓		✓	✓	✓		✓
Bench, woodworking	✓	✓	✓	✓	✓	✓	✓											✓	✓	✓	✓	✓	✓	✓		✓
Biscuit joiner				O		O												O	O	O		O	O			O
Cabinet, paint storage	✓		O	✓	✓	✓	O											✓	✓	✓	✓	✓	✓	✓		O
Cleaner, vacuum	O	O	O	O	O	O	O											O	O	O	O	O	O	O		O
Compressor, air				O		O	O				O	O					O	O	O	O		O	O	O		O
Computer/printer	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Drill (variable, reversible)	✓	O	O	O		O	O			O			✓	✓	✓	✓	O	O	✓	✓	O	✓	✓	O		O
Drill press (floor or bench)	O	O	O	O		O	O										O	O	O	O		O	O	O		O
Drill set (imp & metric)	✓	O	O	O		O	O		O	O			✓	✓	✓	✓	O	O	✓	✓		✓	✓	O		O
Drill, impact									O				O	O	O	O	O									

(1) A basic set of hand tools might include awl, sliding T bevel, sanding block, wood chisels, assorted clamps, compass, wood files, marking gauge, hammer, putty and utility knife, level, mallet, nail set, planes, pliers, plumb bob, ruler, coping, crosscut and rip saws, screwdrivers, squares and a tape measure.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

EQUIPMENT	Concrete Work 3010	Masonry Work 3020	Wall & Ceiling Finishing 3030	Stair Construction 3040	Roof Structures 2 3050	Doors & Trim 3060	Floor covering 3070	Energy Efficient Housing 3080	Renovations/Restorations 3090	Commercial Structures 3100	Site Management 3110	Tool Maintenance 3120	Furniture Making 3 3130	Furniture Making 4 3140	Furniture Repair 3150	Cabinetmaking 3 3160	Cabinetmaking 4 3170	Production Planning 3190	Production Management 3200	Framing Systems 2 3210
LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•																			
Basic set of hand tools (1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓
Bench, equipment																		O		
Bench, woodworking																		O		
Biscuit joiner													O		O			O		
Cabinet, paint storage																				
Cleaner, vacuum			O	O	O	O	O		O			O	✓	✓	✓	O	O	O		
Compressor, air			O	O	O	O							O	O	O	O	O	O		✓
Computer/printer	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Drill (variable, reversible)	O			O		✓			O			O	✓	✓	✓	✓	✓	O		
Drill press (floor or bench)												O	✓	✓	✓			O		
Drill set (imp & metric)				O		✓			O			O	✓	✓	✓	✓	✓	O		
Drill, impact	O	O							O								O			

(1) A basic set of hand tools might include awl, sliding T bevel, sanding block, wood chisels, assorted clamps, compass, wood files, marking gauge, hammer, putty and utility knife, level, mallet, nail set, planes, pliers, plumb bob, ruler, coping, crosscut and rip saws, screwdrivers, squares and a tape measure.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

	Basic Tools & Materials	Building Construction	Project Management	Solid Stock Construction	Turning Operations	Manufactured Materials	Mold Making & Casting	Site Preparation	Concrete Forming	Alternative Foundations	Framing Systems 1	Roof Structures 1	Exterior Finishing	Electrical Systems	Plumbing Systems	Climate Control Systems	Agri-Structures	Multiple Materials	Furniture Making 1	Furniture Making 2	Finishing & Refinishing	Cabinetmaking 1	Cabinetmaking 2	Wood Forming	Manufacturing Systems	Product Development
EQUIPMENT	1010	1070	1120	1130	1140	1160	1180	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2120	2130	2140	2150	2160	2170	2180	2190	2200
LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES																										
Fastener, explosive actuated									O								O									
Former, vacuum							O											O								O
Grinder, tool	O	O	O	O	O	O	O										O	O	O	O		O	O			O
Gun, screw																	O									
Heater, strip																		O								O
Jointer				O	O												O	O	O	O		O	O	O		O
Kiln							O											O								O
Lathe, wood				O	✓		O											O	O	O				O		O
Level, builders		O						O	O	O							O									
Level, laser								O	O	O							O									
Mixer, concrete							O		O	O			O				O	O								O
Molder, rotational							O											O								O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

	Concrete Work	Masonry Work	Wall & Ceiling Finishing	Stair Construction	Roof Structures 2	Doors & Trim	Floor covering	Energy Efficient Housing	Renovations/Restorations	Commercial Structures	Site Management	Tool Maintenance	Furniture Making 3	Furniture Making 4	Furniture Repair	Cabinetmaking 3	Cabinetmaking 4	Production Planning	Production Management	Framing Systems 2
LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•																			
EQUIPMENT	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3190	3200	3210
Fastener, explosive actuated	O	O							O											O
Former, vacuum	O																	O		
Grinder, tool						O			O			✓	✓	✓	✓	O		O		
Gun, screw			✓						O											
Heater, strip																		O		
Jointer						O							✓	✓	✓	✓	O	O		
Kiln																		O		
Lathe, wood				O					O				O	O	O			O		
Level, builders	✓	✓							O											
Level, laser	O	O	O						O								O			
Mixer, concrete	O	O							O											
Molder, rotational																		O		

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2
THEME	A	A	B	B	B	B	B	A	A	A	A	A	A
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•	•	•	•
CREDENTIALLING OPPORTUNITIES													
EQUIPMENT	Basic Tools & Materials	Building Construction	Project Management	Solid Stock Construction	Turning Operations	Manufactured Materials	Mold Making & Casting	Site Preparation	Concrete Forming	Alternative Foundations	Framing Systems 1	Roof Structures 1	Exterior Finishing
	1010	1070	1120	1130	1140	1160	1180	2010	2020	2030	2040	2050	2060
Nailer, pneumatic						O				O	O	O	
Planer, thickness		O		O	O								
Press, injection	O						O						
Router (portable)			O	O		O	O						
Sander, belt (portable)			O	O		O	O						
Sander, combination belt & disc				O		O	O						
Sander, finishing (portable)			O	O		O	O						
Saw, band		O	O	O	O	O	O						
Saw, circular (portable)								O	✓	✓	✓	✓	O
Saw, circular (table)		O		O	O	O	O						
Saw, power miter			O	O									O
Saw, radial arm				O	O	O				O	O	O	

LEVEL	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	A	A	B	B	B	B	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES													
EQUIPMENT	Electrical Systems	Plumbing Systems	Climate Control Systems	Agri-Structures	Multiple Materials	Furniture Making 1	Furniture Making 2	Finishing & Refinishing	Cabinetmaking 1	Cabinetmaking 2	Wood Forming	Manufacturing Systems	Product Development
	2070	2080	2090	2100	2120	2130	2140	2150	2160	2170	2180	2190	2200
Nailer, pneumatic				O		O	O		O	O	O		O
Planer, thickness					O	O	O		O	O	O		O
Press, injection					O								O
Router (portable)					O	O	O		O	O	O		O
Sander, belt (portable)					O	O	O	O	O	O	O		O
Sander, combination belt & disc					O	O	O		O	O	O		O
Sander, finishing (portable)					O	O	O	O	O	O			O
Saw, band					O	O	O		O	O	✓		O
Saw, circular (portable)	O	O	O	✓									✓
Saw, circular (table)				O	O	✓	✓		✓	✓	O		O
Saw, power miter				O	O	O	O		O	O	O		O
Saw, radial arm				O	O	O	O		O	O	O		O

• Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•																			
EQUIPMENT	Concrete Work	Masonry Work	Wall & Ceiling Finishing	Stair Construction	Roof Structures 2	Doors & Trim	Floor covering	Energy Efficient Housing	Renovations/Restorations	Commercial Structures	Site Management	Tool Maintenance	Furniture Making 3	Furniture Making 4	Furniture Repair	Cabinetmaking 3	Cabinetmaking 4	Production Planning	Production Management	Framing Systems 2
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3190	3200	3210
Nailer, pneumatic				O	O	O	O		O				O	O	O		O	O		O
Planer, thickness				O		O			O				✓	✓	✓	O	O	O		
Press, injection																		O		
Router (portable)				O		O			O				✓	✓	✓	O	O	O		
Sander, belt (portable)				O		O			O				✓	✓	✓	O	O	O		
Sander, combination belt & disc													✓	✓	✓	✓		O		
Sander, finishing (portable)				O		O			O				✓	✓	✓	O	O	O		
Saw, band													✓	✓	✓	O		O		
Saw, circular (portable)	✓	O		O	✓				O											✓
Saw, circular (table)	O			O		O			O				✓	✓	✓	O	O	O		
Saw, power miter	O		O	O		✓			O				✓	✓	✓	O	✓	✓		
Saw, radial arm				O	O				O				O	O	O	O		O		O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

	Basic Tools & Materials	Building Construction	Project Management	Solid Stock Construction	Turning Operations	Manufactured Materials	Mold Making & Casting	Site Preparation	Concrete Forming	Alternative Foundations	Framing Systems 1	Roof Structures 1	Exterior Finishing	Electrical Systems	Plumbing Systems	Climate Control Systems	Agri-Structures	Multiple Materials	Furniture Making 1	Furniture Making 2	Finishing & Refinishing	Cabinetmaking 1	Cabinetmaking 2	Wood Forming	Manufacturing Systems	Product Development
LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	B	B	B	B	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES																										
EQUIPMENT	1010	1070	1120	1130	1140	1160	1180	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2120	2130	2140	2150	2160	2170	2180	2190	2200
Saw, sabre (portable)				O		O					O	O	O	O	✓		O	O	O	O		O	O	O		O
Saw, scroll	O		O	O														O	O	O				O		O
Shaper																		O	O	O		O	O	O		O
Table, glue				O		O	O											O	O	O		O	O	O		O
Trimmer, plastic laminate						O												O								O
Vises, woodworking	✓	✓	✓	✓		✓	✓											O	✓	✓		✓	✓	✓		O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

CONSTRUCTION TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Building Systems (Processes & Applications)
B. Manufacturing Systems (Processes & Applications)

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	A
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•																			
EQUIPMENT	Concrete Work	Masonry Work	Wall & Ceiling Finishing	Stair Construction	Roof Structures 2	Doors & Trim	Floor covering	Energy Efficient Housing	Renovations/Restorations	Commercial Structures	Site Management	Tool Maintenance	Furniture Making 3	Furniture Making 4	Furniture Repair	Cabinetmaking 3	Cabinetmaking 4	Production Planning	Production Management	Framing Systems 2
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3190	3200	3210
Saw, sabre (portable)				O					O				✓	✓	✓	✓	✓	O		✓
Saw, scroll													O	O	O	O		O		
Shaper						O			O				O	O	O	O		O		
Table, glue													O	O	O	O		O		
Trimmer, plastic laminate									O						O	✓	✓	O		
Vises, woodworking													✓	✓	✓			O		

• Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters for Cosmetology Studies

Facilities

Selected modules in the Cosmetology Studies scope and sequence can be delivered in a typical classroom setting. Other modules require access to more specialized in-school and/or off-campus facilities. Facilities for courses in Cosmetology Studies, though variable by module, should provide student access to an environment:

- supporting personal grooming activities (Introductory level)
- supporting the sale and provision of professional cosmetology-related services and products (Intermediate and Advanced levels).

Facilities supporting most modules should have:

- suitable work and seating areas
- adequate mirrors
- water and sinks (shampoo and utility)
- display and storage areas for equipment, tools and supplies
- whiteboards/bulletin boards
- fresh air and fume extraction
- lighting capabilities conducive to the use of haircolouring and makeup products
- waste disposal
- telephone service.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment needed to facilitate the delivery of content and enable students to meet the expectations of the modules.

Equipment for modules in Cosmetology Studies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop and to keep current a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations

The maintenance of a safe and sanitary learning/working environment is everyone's business in a facility supporting Cosmetology Studies instruction. Details relating to appropriate lighting, ventilation, personal cleansing and customer service facilities should be addressed when designing a new facility. When operating a facility, suitable equipment and supplies must be available to handle dirty laundry, clean laundry, storage of supplies and the sterilization of tools and implements.

Each Cosmetology Studies module contains learner expectations relating to safety and sanitation. Students can acquire additional competencies relating to safety by enrolling in the following modules.

- CTR 1210: Personal Safety Management
- CTR 2210: Workplace Safety Practices

Instructional Qualifications

Courses in Cosmetology Studies can be implemented by Alberta Certified Teachers who have interest in providing instruction in-school and off-campus learning environments. A background and a journeyman credential in hairstyling and esthetology will be an asset to those providing direct instruction in Cosmetology Studies modules, particularly at the intermediate and advanced level. Teachers may find it desirable to access sources of instructional support available from the hair and beauty industry, professional associations and consultants and relevant government agencies (e.g., Apprenticeship Branch of Advanced Education & Career Development).

To ensure compliance with legislated safety and occupation standards, most modules in Cosmetology Studies require that instruction be provided by a person(s) holding a Journeyman Hairstylist credential. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities

Students who complete successfully 35–55 specified Cosmetology Studies modules can have these accredited toward an apprenticeship in the Hairstylist trade.

Students entering the hairstylist trade should be advised to contact their local Career Development Centre to discuss accreditation of the Cosmetology Studies modules they completed. A list of accredited modules is included in Section D, E or F of the *Guide to Standards and Implementation.*

Some modules within the Cosmetology Studies strand may provide opportunities for students to earn other credentials recognized by business, industry and/or post-secondary institutions. These opportunities may, from time-to-time, occur when business/industry provide local opportunities for additional training.

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Module Parameters Chart

COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images & Practices
B. Hair & Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Hair Colouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

	Personal Images	Hair Graphics 1	Hair & Scalp Care 1	Forming & Finishing 1	Permanent Waving 1	Skin Care 1	Manicuring 1	Theatrical Makeup 1	Hair Graphics 2	Hair & Scalp Care 2	Forming & Finishing 2	Haircutting 1	Hair Care & Cutting 1	Permanent Waving 2	Permanent Waving 3
LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
THEME	A	B	B	B	D	F	H	I	B	B	B	C	C	D	D
INSTRUCTIONAL QUALIFICATIONS			•	•						•	•	•	•	•	•
INSTRUCTIONAL FACILITIES			•	•		•				•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	1010	1020	1030	1040	1050	1060	1070	1080	2010	2020	2030	2040	2050	2060	2070
Brushes, assorted	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓
Canvas blocks and pins															
Cash register													✓		
Chairs, shampoo	✓								✓	✓	✓	✓	✓	✓	✓
Styling, hydraulic	✓								✓	✓	✓	✓	✓	✓	✓
Barber															
Facial, adjustable						✓									
Waiting													✓		
Clippers, electric (assorted)															
Combs, assorted	✓		✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
Colour accelerator															

	Permanent Waving 4	Colouring 1	Colour Removal 1	Colouring & Removal 1	Facials & Makeup 1	Facials & Makeup 2	Skin Care 2	Manicuring 2	Nail Art	Manicuring 3	Hairpieces & Extensions	Theatrical Makeup 2	Historical Cosmetology	Sales & Service 1
LEVEL	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	D	E	E	E	F	F	F	H	H	H	I	I	J	J
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•									•	
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•			•			•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•		•	•			•
RECOMMENDED EQUIPMENT	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210
Brushes, assorted	✓	✓	✓	✓							✓	✓	✓	
Canvas blocks and pins											✓			
Cash register	✓					✓	✓			✓				
Chairs, shampoo	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Styling, hydraulic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barber														
Facial, adjustable					✓	✓	✓							
Waiting	✓			✓		✓	✓			✓				
Clippers, electric (assorted)														
Combs, assorted	✓	✓	✓	✓							✓	✓	✓	
Colour accelerator			✓	✓										

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COSMETOLOGY STUDIES

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H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	C	D	D	D
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Professional Practices	Long Hair Graphics	Hair & Scalp Care 3	Hair & Scalp Care 4	Haircutting 3	Haircutting 4	Hair Care & Cutting 2	Permanent Waving 5	Relax/Straighten Hair	Wave, Relax & StraightenHair
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100
Brushes, assorted	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Canvas blocks and pins										
Cash register	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chairs, shampoo	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Styling, hydraulic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barber										
Facial, adjustable										
Waiting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clippers, electric (assorted)					✓	✓	✓			
Combs, assorted		✓	✓	✓	✓	✓	✓	✓	✓	✓
Colour accelerator										

LEVEL	3	3	3	3	3	3	3	3	3	3
THEME	E	E	E	F	F	F	G	G	H	H
INSTRUCTIONAL QUALIFICATIONS	•	•	•			•	•	•		
INSTRUCTIONAL FACILITIES	•	•	•	•		•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Colouring 2	Colour Removal 2	Colouring & Removal 2	Body Therapy	Hair Removal	Skin Care 3	Male Facial Grooming 1	Male Facial Grooming 2	Nail Technology	Pedicuring
	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200
Brushes, assorted	✓	✓	✓	✓	✓					
Canvas blocks and pins										
Cash register	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chairs, shampoo	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Styling, hydraulic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barber							✓	✓		
Facial, adjustable				✓	✓	✓	✓	✓		
Waiting	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clippers, electric (assorted)					✓		✓	✓		
Combs, assorted	✓	✓	✓							
Colour accelerator	✓	✓	✓							

LEVEL	3	3	3	3	3	3	3	3	3
THEME	H	I	I	I	I	I	J	J	J
INSTRUCTIONAL QUALIFICATIONS							•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES		•	•			•	•		
RECOMMENDED EQUIPMENT	Nail Care	Wigs & Toupes	Hair Goods	Theatrical Makeup 3	Theatrical Makeup 4	Facial & Body Adornment	Creative Cosmetology	Sales & Services 2	Competition Cosmetology
	3210	3220	3230	3240	3250	3260	3270	3280	3290
Brushes, assorted		✓	✓	✓	✓	✓	✓	✓	✓
Canvas blocks and pins		✓	✓						
Cash register	✓	✓	✓	✓	✓	✓	✓	✓	✓
Chairs, shampoo	✓	✓	✓	✓	✓	✓	✓	✓	✓
Styling, hydraulic	✓	✓	✓	✓	✓	✓	✓	✓	✓
Barber									
Facial, adjustable									
Waiting	✓	✓	✓	✓	✓	✓	✓	✓	✓
Clippers, electric (assorted)							✓		✓
Combs, assorted		✓	✓	✓				✓	✓
Colour accelerator									

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Module Parameters Chart

COSMETOLOGY STUDIES

LEVEL
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2 – Intermediate
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THEME
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C. Haircutting
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E. Chemical Services: Hair Colouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	D	F	H	I	B	B	B	C	C	D	D	D	E	E	E	F	F	F	H	H	H	I	I	J	J
INSTRUCTIONAL QUALIFICATIONS			•	•						•	•	•	•	•	•	•	•	•	•									•	
INSTRUCTIONAL FACILITIES			•	•		•				•	•	•	•	•	•	•	•	•	•	•	•	•			•			•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•
RECOMMENDED EQUIPMENT	Personal Images	Hair Graphics 1	Hair & Scalp Care 1	Forming & Finishing 1	Permanent Waving 1	Skin Care 1	Manicuring 1	Theatrical Makeup 1	Hair Graphics 2	Hair & Scalp Care 2	Forming & Finishing 2	Haircutting 1	Hair Care & Cutting 1	Permanent Waving 2	Permanent Waving 3	Permanent Waving 4	Colouring 1	Colour Removal 1	Colouring & Removal 1	Facials & Makeup 1	Facials & Makeup 2	Skin Care 2	Manicuring 2	Nail Art	Manicuring 3	Hairpieces & Extensions	Theatrical Makeup 2	Historical Cosmetology	Sales & Service 1
	1010	1020	1030	1040	1050	1060	1070	1080	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210
Curling irons, assorted	✓			✓							✓		✓													✓		✓	
Dresserettes/Vanities w. mirrors	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Esthetology technology																													
Magnify																				✓	✓	✓							
Tweezers, assorted																													
Esthetological treatment units (e.g. high freq.)																													
False eyelashes																													
Hair blowers	✓			✓				✓	✓	✓	✓	✓	✓														✓	✓	
Hair clips	✓			✓							✓		✓													✓		✓	
Hair crimpers, electric	✓			✓							✓		✓													✓		✓	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COSMETOLOGY STUDIES

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H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	C	D	D	D	E	E	E	F
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•	
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•		•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Professional Practices	Long Hair Graphics	Hair & Scalp Care 3	Hair & Scalp Care 4	Haircutting 3	Haircutting 4	Hair Care & Cutting 2	Permanent Waving 5	Relax/Straighten Hair	Wave, Relax & StraightenHair	Colouring 2	Colour Removal 2	Colouring & Removal 2	Body Therapy
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Curling irons, assorted							✓							
Dresserettes/Vanities w. mirrors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Esthetology technology														✓
Magnify														
Tweezers, assorted							✓							
Esthetological treatment units (e.g. high freq.)														✓
False eyelashes														
Hair blowers	✓	✓	✓	✓	✓	✓	✓							
Hair clips			✓	✓			✓							
Hair crimpers, electric							✓							

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	F	F	G	G	H	H	H	I	I	I	I	I	J	J	J
INSTRUCTIONAL QUALIFICATIONS		•	•	•									•		•
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•		•	•			•	•		
RECOMMENDED EQUIPMENT	Hair Removal	Skin Care 3	Male Facial Grooming 1	Male Facial Grooming 2	Nail Technology	Pedicuring	Nail Care	Wigs & Toupes	Hair Goods	Theatrical Makeup 3	Theatrical Makeup 4	Facial & Body Adornment	Creative Cosmetology	Sales & Services 2	Competition Cosmetology
	3150	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290
Curling irons, assorted								✓	✓				✓		✓
Dresserettes/Vanities w. mirrors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Esthetology technology	✓	✓	✓	✓											
Magnify															
Tweezers, assorted															
Esthetological treatment units (e.g. high freq.)															
False eyelashes												✓	✓		✓
Hair blowers															
Hair clips														✓	
Hair crimpers, electric								✓	✓				✓		✓

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I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2
THEME	A	B	B	B	D	F	H	I	B	B	B	C	C
INSTRUCTIONAL QUALIFICATIONS			•	•						•	•	•	•
INSTRUCTIONAL FACILITIES			•	•		•				•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•		•	•	•	•	•
RECOMMENDED EQUIPMENT	Personal Images	Hair Graphics 1	Hair & Scalp Care 1	Forming & Finishing 1	Permanent Waving 1	Skin Care 1	Manicuring 1	Theatrical Makeup 1	Hair Graphics 2	Hair & Scalp Care 2	Forming & Finishing 2	Haircutting 1	Hair Care & Cutting 1
	1010	1020	1030	1040	1050	1060	1070	1080	2010	2020	2030	2040	2050
Hair dryers/lamp dryers	✓			✓						✓	✓	✓	✓
Hair pieces, assorted													
Hair straightener, electric											✓		✓
Hair testing technology										✓	✓		✓
Hand style mirrors	✓	✓											
Hot combs											✓		✓
Manicure kit, electric													
Finger bowls/baths	✓						✓						
Cuticle scissors	✓						✓						
Cuticle clippers	✓						✓						
Nail files	✓						✓						

LEVEL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	D	D	D	E	E	E	F	F	F	H	H	H	I	I	J	J
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•									•	
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•			•			•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•		•	•			•
RECOMMENDED EQUIPMENT	Permanent Waving 2	Permanent Waving 3	Permanent Waving 4	Colouring 1	Colour Removal 1	Colouring & Removal 1	Facials & Makeup 1	Facials & Makeup 2	Skin Care 2	Manicuring 2	Nail Art	Manicuring 3	Hairpieces & Extensions	Theatrical Makeup 2	Historical Cosmetology	Sales & Service 1
	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210
Hair dryers/lamp dryers				✓	✓	✓							✓		✓	
Hair pieces, assorted													✓			
Hair straightener, electric													✓		✓	
Hair testing technology																
Hand style mirrors																
Hot combs													✓		✓	
Manicure kit, electric										✓		✓				
Finger bowls/baths										✓	✓	✓				
Cuticle scissors										✓	✓	✓				
Cuticle clippers										✓	✓	✓				
Nail files										✓	✓	✓				

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EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	C	D	D	D	E	E	E	F	F	F	G	G	H	H	H	I	I	I	I	I	J	J	J
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•			•	•	•									•		•
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•	•		
RECOMMENDED EQUIPMENT	Professional Practices	Long Hair Graphics	Hair & Scalp Care 3	Hair & Scalp Care 4	Haircutting 3	Haircutting 4	Hair Care & Cutting 2	Permanent Waving 5	Relax/Straighten Hair	Wave, Relax & StraightenHair	Colouring 2	Colour Removal 2	Colouring & Removal 2	Body Therapy	Hair Removal	Skin Care 3	Male Facial Grooming 1	Male Facial Grooming 2	Nail Technology	Pedicuring	Nail Care	Wigs & Toupes	Hair Goods	Theatrical Makeup 3	Theatrical Makeup 4	Facial & Body Adornment	Creative Cosmetology	Sales & Services 2	Competition Cosmetology
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290
Hair dryers/lamp dryers			✓	✓	✓	✓	✓															✓	✓						✓
Hair pieces, assorted																						✓	✓						
Hair straightener, electric							✓			✓												✓	✓				✓		
Hair testing technology			✓	✓	✓	✓	✓																						
Hand style mirrors																													
Hot combs							✓			✓												✓	✓				✓		
Manicure kit, electric																				✓	✓								
Finger bowls/baths																			✓	✓	✓								
Cuticle scissors																			✓	✓	✓								
Cuticle clippers																			✓	✓	✓								
Nail files																			✓	✓	✓								

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J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
THEME	A	B	B	B	D	F	H	I	B	B	B	C	C	D	D
INSTRUCTIONAL QUALIFICATIONS			•	•						•	•	•	•	•	•
INSTRUCTIONAL FACILITIES			•	•		•				•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Personal Images	Hair Graphics 1	Hair & Scalp Care 1	Forming & Finishing 1	Permanent Waving 1	Skin Care 1	Manicuring 1	Theatrical Makeup 1	Hair Graphics 2	Hair & Scalp Care 2	Forming & Finishing 2	Haircutting 1	Hair Care & Cutting 1	Permanent Waving 2	Permanent Waving 3
	1010	1020	1030	1040	1050	1060	1070	1080	2010	2020	2030	2040	2050	2060	2070
Manicure kit, electric															
Nail repair/extension kits															
Foot Baths															
Mannequins and Stands	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Neck dusters															
Perm waving equipment					✓									✓	
Perm rods, croquignole					✓									✓	
Perm rods, spiral														✓	
Perm designer 'Rods'														✓	
Perm rod containers					✓									✓	
Perm wave technology														✓	✓

LEVEL	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	D	E	E	E	F	F	F	H	H	H	I	I	J	J
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•									•	
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•			•			•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•		•	•			•
RECOMMENDED EQUIPMENT	Permanent Waving 4	Colouring 1	Colour Removal 1	Colouring & Removal 1	Facials & Makeup 1	Facials & Makeup 2	Skin Care 2	Manicuring 2	Nail Art	Manicuring 3	Hairpieces & Extensions	Theatrical Makeup 2	Historical Cosmetology	Sales & Service 1
	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210
Manicure kit, electric								✓		✓				
Nail repair/extension kits														
Foot Baths														
Mannequins and Stands	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓
Neck dusters														
Perm waving equipment	✓													
Perm rods, croquignole	✓													
Perm rods, spiral	✓													
Perm designer 'Rods'	✓													
Perm rod containers	✓													
Perm wave technology	✓													

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images & Practices
B. Hair & Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Hair Colouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	C	D	D	D	E	E	E	F	F
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•		
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•		•	•	•	•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Professional Practices	Long Hair Graphics	Hair & Scalp Care 3	Hair & Scalp Care 4	Haircutting 3	Haircutting 4	Hair Care & Cutting 2	Permanent Waving 5	Relax/Straighten Hair	Wave, Relax & StraightenHair	Colouring 2	Colour Removal 2	Colouring & Removal 2	Body Therapy	Hair Removal
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150
Manicure kit, electric															
Nail repair/extension kits															
Foot Baths															
Mannequins and Stands	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Neck dusters					✓	✓	✓								✓
Perm waving equipment									✓	✓					
Perm rods, croquignole															
Perm rods, spiral															
Perm designer 'Rods'															
Perm rod containers															
Perm wave technology										✓					

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	F	G	G	H	H	H	I	I	I	I	I	J	J	J
INSTRUCTIONAL QUALIFICATIONS	•	•	•									•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•		•	•			•	•		
RECOMMENDED EQUIPMENT	Skin Care 3	Male Facial Grooming 1	Male Facial Grooming 2	Nail Technology	Pedicuring	Nail Care	Wigs & Toupes	Hair Goods	Theatrical Makeup 3	Theatrical Makeup 4	Facial & Body Adornment	Creative Cosmetology	Sales & Services 2	Competition Cosmetology
	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290
Manicure kit, electric					✓	✓								
Nail repair/extension kits				✓		✓								
Foot Baths				✓		✓								
Mannequins and Stands	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓
Neck dusters	✓	✓	✓									✓		✓
Perm waving equipment														
Perm rods, croquignole														
Perm rods, spiral														
Perm designer 'Rods'														
Perm rod containers														
Perm wave technology														

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images & Practices
B. Hair & Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Hair Colouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	D	F	H	I	B	B	B	C	C	D	D	D	E	E	E	F	F	F	H	H	H	I	I	J	J
INSTRUCTIONAL QUALIFICATIONS			•	•						•	•	•	•	•	•	•	•	•	•									•	
INSTRUCTIONAL FACILITIES			•	•		•				•	•	•	•	•	•	•	•	•	•	•	•	•			•			•	
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•			•
RECOMMENDED EQUIPMENT	Personal Images	Hair Graphics 1	Hair & Scalp Care 1	Forming & Finishing 1	Permanent Waving 1	Skin Care 1	Manicuring 1	Theatrical Makeup 1	Hair Graphics 2	Hair & Scalp Care 2	Forming & Finishing 2	Haircutting 1	Hair Care & Cutting 1	Permanent Waving 2	Permanent Waving 3	Permanent Waving 4	Colouring 1	Colour Removal 1	Colouring & Removal 1	Facials & Makeup 1	Facials & Makeup 2	Skin Care 2	Manicuring 2	Nail Art	Manicuring 3	Hairpieces & Extensions	Theatrical Makeup 2	Historical Cosmetology	Sales & Service 1
	1010	1020	1030	1040	1050	1060	1070	1080	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200	2210
Polystyrene blocks and pins																										✓			
Razors, assorted																													
Reception desk													✓			✓			✓		✓	✓			✓				
Rollers, assorted	✓			✓							✓		✓													✓		✓	
Shears, assorted												✓	✓																
Steamer, scalp										✓			✓																
Steamers, facial																													
Tent style folding mirrors	✓	✓																											
Towels, coloured													✓	✓	✓	✓	✓	✓	✓	✓									
Vibro-massager, electric																				✓	✓	✓							
Wax heaters/applicators																													
Wigs, assorted																										✓			

Note: Most modules require access to student work areas (tables/desks), utility and shampoo sinks, a teachers desk filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterlizers (ultra violet & glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

COSMETOLOGY STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Images & Practices
B. Hair & Scalp Care
C. Haircutting
D. Chemical Services: Permanent Waving
E. Chemical Services: Hair Colouring
F. Skin Care
G. Male Facial Grooming
H. Nail Care
I. Special Effects/Services
J. Enterprise & Competition

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	C	D	D	D	E	E	E	F
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•	
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•		•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•
RECOMMENDED EQUIPMENT	Professional Practices	Long Hair Graphics	Hair & Scalp Care 3	Hair & Scalp Care 4	Haircutting 3	Haircutting 4	Hair Care & Cutting 2	Permanent Waving 5	Relax/Straighten Hair	Wave, Relax & StraightenHair	Colouring 2	Colour Removal 2	Colouring & Removal 2	Body Therapy
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Polystyrene blocks and pins														
Razors, assorted					✓	✓	✓							
Reception desk	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rollers, assorted			✓	✓			✓							
Shears, assorted					✓	✓	✓							
Steamer, scalp			✓	✓		✓	✓							
Steamers, facial														✓
Tent style folding mirrors														
Towels, coloured														
Vibro-massager, electric														✓
Wax heaters/applicators							✓							✓
Wigs, assorted														

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	F	F	G	G	H	H	H	I	I	I	I	I	J	J	J
INSTRUCTIONAL QUALIFICATIONS		•	•	•									•		•
INSTRUCTIONAL FACILITIES		•	•	•	•	•	•	•	•	•	•	•	•		•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•		•	•			•	•		
RECOMMENDED EQUIPMENT	Hair Removal	Skin Care 3	Male Facial Grooming 1	Male Facial Grooming 2	Nail Technology	Pedicuring	Nail Care	Wigs & Toupes	Hair Goods	Theatrical Makeup 3	Theatrical Makeup 4	Facial & Body Adornment	Creative Cosmetology	Sales & Services 2	Competition Cosmetology
	3150	3160	3170	3180	3190	3200	3210	3220	3230	3240	3250	3260	3270	3280	3290
Polystyrene blocks and pins								✓	✓						
Razors, assorted			✓	✓											
Reception desk	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rollers, assorted														✓	
Shears, assorted															
Steamer, scalp															
Steamers, facial	✓	✓	✓	✓											
Tent style folding mirrors															
Towels, coloured															
Vibro-massager, electric	✓	✓													
Wax heaters/applicators															
Wigs, assorted								✓	✓						

Note: Most modules require access to student work areas (tables/desks), utility and shampoo sinks, a teachers desk filing cabinets, magazine/book racks, washing machine, clothes dryer, sanitizers/sterlizers (ultra violet & glass), white towels, utility trolleys, capes/gowns, and graduated plastic applicators.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters for Design Studies

Facilities
Some modules in the Design Studies scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone/data line service.

The type of facility and equipment required for the Design Studies strand will be determined by the nature and scope of the program being offered. Programs emphasizing the drafting component of the strand will require computers with CAD (Computer Assisted Design) software and associated printers/plotters and/or drafting tables with drafting machines. For students to develop adequate two- and three-dimensional designing skills, some form of specialized equipment or facility should be available. The two-dimensional design modules can be taught using drafting or art tables with a set of design materials and/or using computers with graphic design software. Three-dimensional design at the intermediate and advanced levels will require some specialized hand and power tools appropriate for the materials being used in designing. The facility might require specialized power outlets, dust and fume extraction and access to water. Given these parameters, a reasonable Design Studies program could be provided in existing Industrial Arts multiple activity lab, Fine Art lab or drafting facility.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations
Safety and security issues in Design Studies will depend on the scope of the program provided. Safety with respect to the use of equipment, materials and supplies will be important in two-dimensional design (e.g., use of knives, scissors, spray adhesives) and three-dimensional design (e.g., machines and tools for cutting, model making). Ergonomic considerations must also be attended to where students work at computers and tables. Security should include power lockouts where power equipment (e.g. band saw) is used in the program. Appropriate security measures should also be adopted for tracking equipment and supplies.

Instructional Qualifications
Courses in Design Studies can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in art, science, visual communication and/or relevant industry will be an asset to those who provide instruction in Design Studies modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to

access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies.

Designers are professional creators who solve practical problems through their creations. Teachers of Art, Commercial Art, Industrial Arts, Drafting and Clothing and Textiles may find a transition into Design Studies relatively easy, as they will have had some experience with the content, and perhaps the conceptual framework. Due to the scope of the program, additional training through university, college or technical schools would be beneficial. Teachers with formal design training will clearly have an advantage.

To ensure compliance with safety and industry standards, some modules require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
There is no formal articulation to an apprenticeable trade; however, some aspects of Design Studies would support the Graphic Arts Craftsman - Pre-press Certification. The emphasis on problem-solving in Design Studies makes it valuable for all trades, occupations and professions, but no credentialling opportunities exist at this time.

Module Parameters Chart

DESIGN STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	B	B	A	A	B	B	B	C	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS																															
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•
CREDENTIALLING OPPORTUNITIES																															
EQUIPMENT	Sketch, Draw & Model	The Design Process	2-D Design Fundamentals	3-D Design Fundamentals	CAD Fundmentals	Drafting/Design Fundamentals	2-D Design Applications	3-D Design Applications	CAD Applications	Drafting/Design Applications	Technical Drawing Applications	The Evolution of Design	2-D Design Studio 1	2-D Design Studio 2	2-Design Studio 3	3-D Design Studio 1	3-D Design Studio 2	3-D Design Studio 3	Living Environment Studio 1	Living Environment Studio 2	Living Environment Studio 3	CAD Modelling Studio	Drafting/Design Studio 1	Drafting/Design Studio 2	Drafting/Design Studio 3	Technical Drawing Studio 1	Technical Drawing Studio 2	Technical Drawing Studio 3	Visualizing the Future	The Design Profession	Portfolio Presentation
	1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190
Art materials (1)	✓	✓	✓	✓		✓	✓	✓		✓		○	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓				○		✓
Assorted materials for model making & testing	✓	✓	○	✓		○	○	✓		○	○	○				✓	✓	✓	○	○	○		○	○	○	○	○	○	○		○
Band saw	○	○		○				✓								✓	✓	✓	○	○	○										
Basic drafting materials & equipment	○	○	○	○		✓	○	○		✓	✓	○	○	○	○	○	○	○	○	○	○		✓	✓	✓	✓	✓	✓	○		○
CAD software					✓	○		○	✓	○	○					○	○	○	○	○	○	✓	✓	✓	✓	✓	✓	✓	○		○
Computers with graphics capability & support software, telecommunication capability, modem, word processing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drawing/Drafting tables	✓	✓	✓	✓		✓	✓	✓		✓	✓	○	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	○		✓
Display units	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Extensive RAM & storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

DESIGN STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Design Skills, Processes and Applications
B. Drafting for Design and Technical Drawing Skills
C. Business/Issues/History

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2
THEME	A	A	A	A	B	B	A	A	B	B	B	C
INSTRUCTIONAL QUALIFICATIONS												
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	
CREDENTIALLING OPPORTUNITIES												
EQUIPMENT	Sketch, Draw & Model	The Design Process	2-D Design Fundamentals	3-D Design Fundamentals	CAD Fundmentals	Drafting/Design Fundamentals	2-D Design Applications	3-D Design Applications	CAD Applications	Drafting/Design Applications	Technical Drawing Applications	The Evolution of Design
	1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060
Hand tools for wood, metal & plastic	✓	✓	O	✓				✓				
Laser printer & plotter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storage & drying racks	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓
Styrofoam cutter	O	O	O	O				✓			✓	
Table saw	O	O	O	O				✓				
Video camera & editing equipment	O	O	O	O		O	O	O		O	O	O
Vises, wood, plastic & metal	✓	✓	✓	✓				✓				
Work benches	✓	✓	✓	✓				✓				
Work tables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O
Data lines for computer access to Internet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modem line for computer access to Internet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS																			
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•
CREDENTIALLING OPPORTUNITIES																			
EQUIPMENT	2-D Design Studio 1	2-D Design Studio 2	2-Design Studio 3	3-D Design Studio 1	3-D Design Studio 2	3-D Design Studio 3	Living Environment Studio 1	Living Environment Studio 2	Living Environment Studio 3	CAD Modelling Studio	Drafting/Design Studio 1	Drafting/Design Studio 2	Drafting/Design Studio 3	Technical Drawing Studio 1	Technical Drawing Studio 2	Technical Drawing Studio 3	Visualizing the Future	The Design Profession	Portfolio Presentation
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190
Hand tools for wood, metal & plastic				✓	✓	✓	✓	✓	✓										
Laser printer & plotter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Storage & drying racks	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
Styrofoam cutter				✓	✓	✓	O	O	O		O	O	O						
Table saw				✓	✓	✓	O	O	O										
Video camera & editing equipment	O	O	O	O	O	O	O	O	O		O	O	O				O	O	✓
Vises, wood, plastic & metal				✓	✓	✓	✓	✓	✓										
Work benches				✓	✓	✓	✓	✓	✓										O
Work tables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	O	✓
Data lines for computer access to Internet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Modem line for computer access to Internet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

(1) Art Materials might include a variety of pencils (4H-4B), water colour brushes, poster paint, coloured markers, drawing pens, india ink, charcoal, various types of drawing/sketching paper and card, xacto knife.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters for Electro-Technologies

Facilities
Electro-Technologies programs require specialized equipment and facilities for most modules. By using simulation software packages, facilities could be adapted to accommodate more computer stations and fewer stations with specialized electronic equipment. In planning a facility for Electro-Technologies, ensure that there is:

- adequate ventilation for soldering
- adequate space for a resource centre
- water and sink
- whiteboards/bulletin boards and overhead screen
- work stations with electrical power outlets and equipment storage
- telephone and cable service.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
An equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies recommended and optional equipment necessary to meet the expectations of the modules. The number, make and model of equipment would need to be determined locally depending on instructional strategies (e.g., use of simulation programs).

Equipment for modules in Electro-Technologies can be accessed through a combination of measures that could include purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations
Maintaining a safe and secure environment is essential when delivering an Electro-Technologies program. The following issues need to be addressed:

- safe laboratory/shop equipment layout
- establish laboratory/shop management procedures
- provision for electrical power lockout
- procedures for power use of tools and equipment
- procedures to follow when an accident occurs
- preventative accident/equipment maintenance program.

Instructional Qualifications
Effective planning and delivery of Electro-Technologies modules is contingent on teachers having content expertise. Industry training and experience are assets, particularly at the intermediate and advanced levels. Modules that are considered for advanced standing in an apprenticeship trade will require a teacher/instructor possessing a Journeyman Certificate in that trade. In selected modules, where customer work and high current and voltages exist, the teacher must also possess a Journeyman Certificate.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Students may earn credentials recognized by industry and post-secondary institutions by demonstrating a specific set of competencies. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

Module Parameters Chart

ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication & Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

	Electro-Assembly 1	Conversion & Distribution	Electronic Power Supply 1	Digital Technology 1	Control Systems 1	Analog Communication 1	Electronic Communication	Security Systems 1	Robotics 1	Electro-Assembly 2	Electrical Servicing	Branch Circuit Wiring	Electronic Power Supply 2	Digital Technology 2	Computer Technology	Control Systems 2	Analog Communication 2	Radio Communication	Security Systems 2	Electro-optics	Magnetic Control Devices	Robotics 2	Electronic Control
LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
EQUIPMENT	1010	1030	1050	1060	1080	1090	1100	1110	1130	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Ammeter, clamp-on	✓	✓				✓	✓				✓	✓									✓		✓
Analog V.O.M.	✓									✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Bread board holder	✓		✓					✓	✓														
Capacitance meter	✓		✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Coaxial cable stripper	✓																						
Computer/printer/modem	O	O	O	O	O	O	O	O	O	O	O	O	✓	✓	✓	✓	✓	✓	✓	O	O	✓	✓
Conduit bender		✓									✓												
Desoldering bulb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Desoldering wick	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Digital logic trainer														✓					✓				✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

ELECTRO-TECHNOLOGIES

LEVEL
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2 – Intermediate
3 – Advanced

THEME
A. Fabrication & Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•			•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3	Electronic Servicing	Power Systems & Services	Generation/Transformation	Digital Technology 3	Digital Applications	Microprocessors	Microprocessor Interfacing	Analog Communication 3	Amplifiers	Data/Telemetry Systems	Motors	Robotics 3	Control Applications
	3010	3020	3030	3040	3060	3070	3080	3090	3100	3110	3130	3140	3150	3160
Ammeter, clamp-on		✓	✓	✓								✓		
Analog V.O.M.														
Bread board holder	✓													
Capacitance meter	✓	✓			✓	✓			✓	✓			✓	
Coaxial cable stripper		✓												
Computer/printer/modem	O	✓	O	O	✓	✓	✓	✓	✓	O	✓	O	✓	O
Conduit bender														
Desoldering bulb	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Desoldering wick	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Digital logic trainer					✓	✓	✓	✓			✓		✓	

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E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

EQUIPMENT	Electro-Assembly 1 1010	Conversion & Distribution 1030	Electronic Power Supply 1 1050	Digital Technology 1 1060	Control Systems 1 1080	Analog Communication 1 1090	Electronic Communication 1100	Security Systems 1 1110	Robotics 1 1130	Electro-Assembly 2 2010	Electrical Servicing 2020	Branch Circuit Wiring 2030	Electronic Power Supply 2 2050	Digital Technology 2 2060	Computer Technology 2070	Control Systems 2 2080	Analog Communication 2 2090	Radio Communication 2100	Security Systems 2 2110	Electro-optics 2120	Magnetic Control Devices 2130	Robotics 2 2140	Electronic Control 2150
LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
Digital multimeter	O		✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drill press	✓							✓	✓	✓	✓								✓			✓	✓
Fibre optics training kit																				✓			
Frequency counter														✓			✓	✓					
Function genderator						✓	✓				✓			✓			✓	✓					
Heat sinks	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy duty utility pliers (channel lock)		✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
High voltage probe											✓												
I/E insertion/removal tool	✓		✓	✓				✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	
Inductance meter	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Isolation transformer										✓			✓				✓	✓					✓

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THEME
A. Fabrication & Service Principles
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E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•			•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3	Electronic Servicing	Power Systems & Services	Generation/Transformation	Digital Technology 3	Digital Applications	Microprocessors	Microprocessor Interfacing	Analog Communication 3	Amplifiers	Data/Telemetry Systems	Motors	Robotics 3	Control Applications
	3010	3020	3030	3040	3060	3070	3080	3090	3100	3110	3130	3140	3150	3160
Digital multimeter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drill press	✓	✓										✓	✓	✓
Fibre optics training kit														
Frequency counter	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓			
Function genderator	✓	✓			✓	✓			✓	✓			✓	
Heat sinks	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Heavy duty utility pliers (channel lock)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
High voltage probe		✓										✓		
I/E insertion/removal tool	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	
Inductance meter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Isolation transformer	✓	✓	✓	✓						✓		✓	✓	✓

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A. Fabrication & Service Principles
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EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
EQUIPMENT	Electro-Assembly 1	Conversion & Distribution	Electronic Power Supply 1	Digital Technology 1	Control Systems 1	Analog Communication 1	Electronic Communication	Security Systems 1	Robotics 1	Electro-Assembly 2	Electrical Servicing	Branch Circuit Wiring	Electronic Power Supply 2	Digital Technology 2	Computer Technology	Control Systems 2	Analog Communication 2	Radio Communication	Security Systems 2	Electro-optics	Magnetic Control Devices	Robotics 2	Electronic Control
	1010	1030	1050	1060	1080	1090	1100	1110	1130	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Jeweler screwdriver	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laser training kit																				✓			
Lead bender & crimper	✓		✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lineman's pliers	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Logic probe	○		✓	✓				✓	✓					✓	✓				✓			✓	
Microprocessor trainer																					✓		
Modular crimping tool	✓																						
Multipurpose tool	✓	✓	✓					✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Needle nose pliers	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-metallic sheath cable strippers		✓										✓											

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Module Parameters Chart

ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
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THEME
A. Fabrication & Service Principles
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C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•			•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3 3010	Electronic Servicing 3020	Power Systems & Services 3030	Generation/Transformation 3040	Digital Technology 3 3060	Digital Applications 3070	Microprocessors 3080	Microprocessor Interfacing 3090	Analog Communication 3 3100	Amplifiers 3110	Data/Telemetry Systems 3130	Motors 3140	Robotics 3 3150	Control Applications 3160
Jeweler screwdriver	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Laser training kit													✓	
Lead bender & crimper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lineman's pliers			✓	✓								✓		
Logic probe	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓
Microprocessor trainer					✓	✓	✓						✓	✓
Modular crimping tool		✓						✓			✓			
Multipurpose tool	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Needle nose pliers	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Non-metallic sheath cable strippers			✓	✓										

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EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
EQUIPMENT	Electro-Assembly 1	Conversion & Distribution	Electronic Power Supply 1	Digital Technology 1	Control Systems 1	Analog Communication 1	Electronic Communication	Security Systems 1	Robotics 1	Electro-Assembly 2	Electrical Servicing	Branch Circuit Wiring	Electronic Power Supply 2	Digital Technology 2	Computer Technology	Control Systems 2	Analog Communication 2	Radio Communication	Security Systems 2	Electro-optics	Magnetic Control Devices	Robotics 2	Electronic Control
	1010	1030	1050	1060	1080	1090	1100	1110	1130	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Nut drivers, 1/4" - 1/2"	✓		✓					✓	✓	✓									✓			✓	
Oscilloscope						✓	✓				✓		✓				✓	✓				✓	
Programmable Logic Controller								✓											✓				✓
Pan A Vise (vacuum base)	✓		✓					✓	✓	✓	✓		✓	✓		✓	✓	✓	✓			✓	
Printed circuit fabrication kit	O		O	O	O	O	O	O	O	✓	O		O	O	O	O	O	O	O	O	O	O	O
R.F. generator																	✓	✓			✓	✓	✓
Regulated power supply		✓	✓			✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, assorted flat blade	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, Phillips, 0, 1, 2, 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, Robertson, 0, 1, 2, 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•			•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3	Electronic Servicing	Power Systems & Services	Generation/Transformation	Digital Technology 3	Digital Applications	Microprocessors	Microprocessor Interfacing	Analog Communication 3	Amplifiers	Data/Telemetry Systems	Motors	Robotics 3	Control Applications
	3010	3020	3030	3040	3060	3070	3080	3090	3100	3110	3130	3140	3150	3160
Nut drivers, 1/4" - 1/2"	✓	✓										✓	✓	✓
Oscilloscope	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓
Programmable Logic Controller								✓					✓	✓
Pan A Vise (vacuum base)	✓	✓							✓				✓	
Printed circuit fabrication kit	✓	○			○	○			○	○			○	○
R.F. generator	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓
Regulated power supply	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, assorted flat blade	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, Phillips, 0, 1, 2, 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Screwdriver, Robertson, 0, 1, 2, 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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EQUIPMENT
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O Optional

	Electro-Assembly 1	Conversion & Distribution	Electronic Power Supply 1	Digital Technology 1	Control Systems 1	Analog Communication 1	Electronic Communication	Security Systems 1	Robotics 1	Electro-Assembly 2	Electrical Servicing	Branch Circuit Wiring	Electronic Power Supply 2	Digital Technology 2	Computer Technology	Control Systems 2	Analog Communication 2	Radio Communication	Security Systems 2	Electro-optics	Magnetic Control Devices	Robotics 2	Electronic Control
LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
EQUIPMENT	1010	1030	1050	1060	1080	1090	1100	1110	1130	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Soldering gun/pencil/station	✓	✓	✓	✓	✓	O	O	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sound meter dB						✓	✓										✓	✓	✓				
Standard swivel head	✓	✓						✓	✓														
Tape measure	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Test light	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Torx screwdriver	✓	✓					✓		✓	✓	✓								✓			✓	
Transistor tester			✓					✓	✓	✓	✓		✓	✓		✓	✓	✓	✓	✓		✓	
TV dot bar generator																							
Utility knife	✓	✓							✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Watt meter													✓				✓						

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Module Parameters Chart

LEVEL
1 – Introductory
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3 – Advanced

THEME
A. Fabrication & Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

ELECTRO-TECHNOLOGIES

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•				•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3	Electronic Servicing	Power Systems & Services	Generation/Transformation	Digital Technology 3	Digital Applications	Microprocessors	Microprocessor Interfacing	Analog Communication 3	Amplifiers	Data/Telemetry Systems	Motors	Robotics 3	Control Applications
	3010	3020	3030	3040	3060	3070	3080	3090	3100	3110	3130	3140	3150	3160
Soldering gun/pencil/station	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sound meter dB		✓							✓	✓				
Standard swivel head														
Tape measure	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Test light	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Torx screwdriver	✓	✓											✓	✓
Transistor tester	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TV dot bar generator		✓												
Utility knife	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Watt meter			✓	✓					✓	✓		✓		

• Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication & Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	D	D	E	A	A	B	B	C	C	C	D	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS												•											•
INSTRUCTIONAL FACILITIES	•	•		•	•	•	•	•	•	•	•	•					•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																							
EQUIPMENT	Electro-Assembly 1	Conversion & Distribution	Electronic Power Supply 1	Digital Technology 1	Control Systems 1	Analog Communication 1	Electronic Communication	Security Systems 1	Robotics 1	Electro-Assembly 2	Electrical Servicing	Branch Circuit Wiring	Electronic Power Supply 2	Digital Technology 2	Computer Technology	Control Systems 2	Analog Communication 2	Radio Communication	Security Systems 2	Electro-optics	Magnetic Control Devices	Robotics 2	Electronic Control
	1010	1030	1050	1060	1080	1090	1100	1110	1130	2010	2020	2030	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150
Wire gauge	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire stripper	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wirecutters, 100 mm	✓	✓		✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wirecutters, 200 mm	✓	✓								✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

ELECTRO-TECHNOLOGIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Fabrication & Service Principles
B. Power Systems
C. Computer Logic Systems
D. Communication Systems
E. Robotic & Control Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	C	C	C	C	D	D	D	E	E	E
INSTRUCTIONAL QUALIFICATIONS			•	•								•		•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•			•	•	•	•
CREDENTIALLING OPPORTUNITIES														
EQUIPMENT	Electro-Assembly 3	Electronic Servicing	Power Systems & Services	Generation/Transformation	Digital Technology 3	Digital Applications	Microprocessors	Microprocessor Interfacing	Analog Communication 3	Amplifiers	Data/Telemetry Systems	Motors	Robotics 3	Control Applications
	3010	3020	3030	3040	3060	3070	3080	3090	3100	3110	3130	3140	3150	3160
Wire gauge	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wire stripper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wirecutters, 100 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Energy and Mines

Facilities
Some modules in the Energy and Mines scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- outdoor environments
- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service.

Modules that require access to facilities not present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
An equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the expectations of the modules.

Equipment for modules in Energy and Mines can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations
Facilities used to support an Energy and Mines program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and establish appropriate personal and environmental health and safety procedures in modules that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- field-based investigations

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

Instructional Qualifications
Courses in Energy and Mines can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science, social studies and/or relevant industry (i.e. resource exploration, recovery or production) will be an asset to those who provide instruction in Energy and Mines modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from industry, professional associations and consultants, and relevant government agencies (e.g., Alberta Energy).

To ensure compliance with safety and industry standards, some modules may require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Some modules within the Energy and Mines strand provide opportunities for students to earn either complete or partial credentials recognized by business, industry and/or post-secondary institutions. Modules that link with credentialling opportunities relevant to the exploration, recovery and/or production sectors are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

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Module Parameters Chart

ENERGY & MINES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

EQUIPMENT
✓ Recommended
O Optional

EQUIPMENT	Overview of Alberta Geology 1010	Nonrenewable Resources 1020	Renewable Resources 1050	Consumer Products & Services 1060	Fundamentals of Recycling 1090	Conservation Challenge 1100	Managing Alberta's Resources 2010	Conventional Oil/Gas 1 2020	Oil Sands/Heavy Oil/Coal 1 2030	Metals/Nonmetals 1 2040	Revewable Energy Technology 2050	Refining Hydrocarbons 2060	Refining Rocks & Minerals 2070	Supply & Distribution 2080	Energy Designs/Systems 1 2090	Environmental Safety 2100	Energy & the Environment 3010	Conventional Oil/Gas 2 3020	Oil Sands/ Heavy Oil/Coal 2 3030	Metals/Nonmetals 2 3040	Sustainable Energy 3050	Petrochemicals 3060	Industrial Materials 3070	Market Basics & Trends 3080	Energy Designs/Systems 2 3090	Integrated Resource Management 3100
LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	A	B	B	B	B	B	B	B	C	C	A	B	B	B	B	B	B	B	C	C
INSTRUCTIONAL QUALIFICATIONS																										
INSTRUCTIONAL FACILITIES		•	•	•	•			•	•	•	•	•	•		•			•	•	•		•	•		•	
CREDENTIALLING OPPORTUNITIES								•						•		•		•								
Anemometer			O								O															
Blueprints, home, office															✓										✓	
Computer & software						O									O										O	
Electrical generator			✓								O															
Fuel cell			O								O															
Gas detector		O						O	O	O								O	O	O						
Kit, air testing						O			O								O									
Kit, soil testing						O			O								O									
Kit, water testing						O			O								O									
Magnifying glass, large			O								O															
Maps, aerial		O						✓	✓	✓																
Maps, geological	✓	✓						✓	✓	✓																
Maps, meteorological															✓										✓	
Maps, topographical	✓							✓	✓	✓																
Meter, pH testing						O											O									

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

ENERGY & MINES

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3
THEME	A	B	B	B	C	C	A	B	B	B	B	B	B	B	C	C	A	B	B	B	B	B	B	B	C	C
INSTRUCTIONAL QUALIFICATIONS																										
INSTRUCTIONAL FACILITIES		•	•	•	•			•	•	•	•	•	•		•			•	•	•		•	•		•	
CREDENTIALLING OPPORTUNITIES								•						•		•		•								
EQUIPMENT	Overview of Alberta Geology	Nonrenewable Resources	Renewable Resources	Consumer Products & Services	Fundamentals of Recycling	Conservation Challenge	Managing Alberta's Resources	Conventional Oil/Gas 1	Oil Sands/Heavy Oil/Coal 1	Metals/Nonmetals 1	Revewable Energy Technology	Refining Hydrocarbons	Refining Rocks & Minerals	Supply & Distribution	Energy Designs/Systems 1	Environmental Safety	Energy & the Environment	Conventional Oil/Gas 2	Oil Sands/ Heavy Oil/Coal 2	Metals/Nonmetals 2	Sustainable Energy	Petrochemicals	Industrial Materials	Market Basics & Trends	Energy Designs/Systems 2	Integrated Resource Management
	1010	1020	1050	1060	1090	1100	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100
Mirror, parabolic			O								O															
Model, combustion engine																					O					
Model, energy efficient structure															✓		O								✓	
Personal safety gear (1)								✓	✓	✓	✓	✓	✓					✓	✓	✓		✓	✓			
Sample products, coal		✓		✓									✓													
Sample products, mineral		✓		✓									✓										✓			
Sample products, petrochemical		✓		✓														O				✓				
Sample products, petroleum		✓										✓						✓	✓			✓				
Sample drill cores	O	O						✓	✓	✓																
Solar cell			O								✓										O					
Solar collector panel			O								✓															
Specimen set, rock & mineral	✓	✓						✓	✓	✓																
Table, drafting															O										O	
Turbine, water			O								✓															
Turbine, wind			O								✓															

(1) Personal safety gear includes hard hat, safety glasses, ear protectors, gloves, respirator, steel-toed boots as required.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Fabrication Studies

Facilities
CTS programs centred around Fabrication Studies should include modules that link with facilities that are readily available in the school and/or community. When selecting or planning a facility for Fabrication Studies, ensure:

- adequate space for instruction
- ample storage space for materials and projects
- adequate services to run the equipment
- provision for fume extraction and welding curtains
- access to water and service doors
- appropriate ambient features the promote learning
- fire protection.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules and equipment that is considered optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for modules in Fabrication Studies can be obtained through a combination of procedures such as: purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations
A number of safety issues exist related to the maintenance and use of specialized power equipment, handling and storage of materials and behaviour of students while working in a shop environment. Extra care should be taken to ensure that facilities and equipment are well maintained and that students understand and practice safe work habits at all times. In addition, it is also important to have procedures in place to lock out gas and power services as well as secure tools and material supplies.

Instructional Qualifications
Due to the nature of the Fabrication Studies strand, most modules require some form of specialized training provided primarily by recognized institutions responsible for occupational, technical or teacher preparation. Other forms of specialized training may also be provided through training seminars, workshops and other short courses. However, if a module is to be used to gain advanced standing in an apprenticeable trade, instruction must be provided by a teacher/instructor with journeyman qualifications.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities

Students may earn credentials recognized by industry and post-secondary institutions by demonstrating a specific set of competencies. Modules requiring additional teacher/instructor credentials are identified in the module parameter chart relevant to the Welder trade. (See the corresponding modules in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

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Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	B	B	C	C	C	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTION FACILITIES	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•		•	•					•	•	•	•	•	•								•	
EQUIPMENT	Basic Tools & Materials	Oxyacetylene Welding	Basic Electric Welding	Sheet Fabrication 1	Fabrication Principles	Bar & Tubular Fabrication	Foundry 1	Principles of Machining	Production Systems	Structural Engineering	Print Reading	Oxyfuel Welding	Thermal Cutting	Arc Welding 1	Arc Welding 2	Gas Metal Arc Welding 1	Sheet Fabrication 2	Sheet Fabrication 2	Forging Fundamentals	Foundry 2	Precision Turning 1	Precision Milling 1	CNC Turning	Custom Fabrication	Pipe Fitting
	CON	1040	1050	1090	1100	1110	1120	1130	1160	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Basic set of hand tools (1)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	O	✓	✓
Anvil	O	O	O	O	O	✓			O			O							✓					O	
Bench, equipment	✓			✓	✓	✓		✓	O	O							O	O	O	O	O	O		O	
Bench, metal working	✓			✓	✓	✓	✓	✓	✓	✓							✓	✓	✓	O	O	O		✓	
Bender c/w accessories	O			O	O	✓													O					O	O
Brake, box and pan	O			✓	O												✓	✓						O	
Buffer, metal (cloth & wire wheel)	O	✓	✓		O	✓	O	O	O			✓		✓	✓	✓	✓	✓						O	
Cabinet, paint storage	✓				O	✓			O										O					O	
Computer c/w printer	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	✓	O	O
Cutter, plasma arc				O	O				O				✓				O	O						O	
Drill press (floor or bench)	O	O		O	✓	✓	O	✓	O								O	O	O		O	O		O	
Drill set (met/imp)	✓	O		✓	✓	✓	✓	✓	O	✓							O	O	O		✓	✓	✓	O	

(1) A basic set of hand tools might include calipers, chiesel, assorted clamps, dividers, file card, assorted files and hammers, putty knife, micrometer, pliers, centre punch, steel ruler, screwdrivers, scriber, tin snips, soldering iron, combination square and measuring tape.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

EQUIPMENT	Materials Testing 3010	Metallurgy Fundamentals 3020	Gas Tungsten Arc Welding 3030	Specialized Welding 3040	Arc Welding 3 3050	Arc Welding 4 3060	Pipe & Tubular Welding 3070	Automated Welding 3080	Sheet Fabrication 4 3090	Sheet Fabrication 5 3110	Foundry 3 3120	Precision Turning 2 3130	Precision Milling 2 3140	CNC Milling 3150	Prefabrication Principles 3160	Gas Metal Art Welding 2 3170
LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•								•	•
Basic set of hand tools (1)	✓	O	✓	✓	✓	✓	✓	O	✓	✓	✓	✓	✓	O	✓	✓
Anvil	O														O	
Bench, equipment									O			O	O		O	
Bench, metal working	✓	✓							✓	✓		O	O		O	
Bender c/w accessories															O	
Brake, box and pan									O	✓					O	
Buffer, metal (cloth & wire wheel)	O	O					O								O	
Cabinet, paint storage															O	
Computer c/w printer	O	O	O	O	O	O	O	O	O	O	O	O	O	✓	O	O
Cutter, plasma arc															O	
Drill press (floor or bench)									O	O		O	O		O	
Drill set (met/imp)									✓	✓		✓		✓	O	

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(1) A basic set of hand tools might include calipers, chiesel, assorted clamps, dividers, file card, assorted files and hammers, putty knife, micrometer, pliers, centre punch, steel ruler, screwdrivers, scriber, tin snips, soldering iron, combination square and measuring tape.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	B	B	C	C	C	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTION FACILITIES	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•		•	•					•	•	•	•	•	•								•	
EQUIPMENT	Basic Tools & Materials	Oxyacetylene Welding	Basic Electric Welding	Sheet Fabrication 1	Fabrication Principles	Bar & Tubular Fabrication	Foundry 1	Principles of Machining	Production Systems	Structural Engineering	Print Reading	Oxyfuel Welding	Thermal Cutting	Arc Welding 1	Arc Welding 2	Gas Metal Arc Welding 1	Sheet Fabrication 2	Sheet Fabrication 2	Forging Fundamentals	Foundry 2	Precision Turning 1	Precision Milling 1	CNC Turning	Custom Fabrication	Pipe Fitting
	CON	1040	1050	1090	1100	1110	1120	1130	1160	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Drill, portable, heavy duty, variable speed, reversible	✓	O		✓	✓	O	O	O	O	O														O	
Folder, bar					O				O								O	✓						O	
Forge, gas fired					O	O													✓					O	
Former, vacuum				O	O																	O			
Furnace, foundry, c/w accessories					O		✓		O											✓				O	
Furnace, heat treating					O														O					O	
Furnace, soldering				O	O	O	O		O								O	O						O	✓
Grinder, angle		✓			O	✓						O	O	O	O	O								O	✓
Grinder, heavy duty		✓	✓		O	✓	O	O	O			✓	✓	✓	✓	✓			O	O				O	
Grinder, tool (bench)	✓	✓		O	✓	✓		✓	O												✓	✓		O	
Heater, strip				O	O																				
Lathe, CNC, c/w accessories					O				O												O		✓	O	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

FABRICATION STUDIES

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•								•	•
EQUIPMENT	Materials Testing	Metallurgy Fundamentals	Gas Tungsten Arc Welding	Specialized Welding	Arc Welding 3	Arc Welding 4	Pipe & Tubular Welding	Automated Welding	Sheet Fabrication 4	Sheet Fabrication 5	Foundry 3	Precision Turning 2	Precision Milling 2	CNC Milling	Prefabrication Principles	Gas Metal Art Welding 2
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3110	3120	3130	3140	3150	3160	3170
Drill, portable, heavy duty, variable speed, reversible									○	○					○	
Folder, bar									✓	✓					○	
Forge, gas fired															○	
Former, vacuum													○			
Furnace, foundry, c/w accessories											✓				○	
Furnace, heat treating		✓													○	
Furnace, soldering									○	○					○	
Grinder, angle			○	○	✓	✓	✓	○							○	✓
Grinder, heavy duty	○	○	○	○	✓	✓	✓	○			○				○	✓
Grinder, tool (bench)	✓								○	○		✓		✓	○	
Heater, strip																
Lathe, CNC, c/w accessories														✓	○	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	B	B	C	C	C	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTION FACILITIES	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•		•	•					•	•	•	•	•	•								•	
EQUIPMENT	Basic Tools & Materials	Oxyacetylene Welding	Basic Electric Welding	Sheet Fabrication 1	Fabrication Principles	Bar & Tubular Fabrication	Foundry 1	Principles of Machining	Production Systems	Structural Engineering	Print Reading	Oxyfuel Welding	Thermal Cutting	Arc Welding 1	Arc Welding 2	Gas Metal Arc Welding 1	Sheet Fabrication 2	Sheet Fabrication 2	Forging Fundamentals	Foundry 2	Precision Turning 1	Precision Milling 1	CNC Turning	Custom Fabrication	Pipe Fitting
	CON	1040	1050	1090	1100	1110	1120	1130	1160	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Lathe, metal, c/w accessories					O		O	✓	O											O	✓	O		O	
Mill, CNC, C/W accessories								O	O															O	
Mill, vertical, c/w accessories					O		✓	O	O											O	O	✓		O	
Notcher				O	O				O								✓	✓						O	
Roll, slip	✓			✓	O				O								✓	✓						O	
Rotary, machine and rollers				O																				O	
Saw, band, comb. horizontal/vertical		✓			O	O		O	O			O		O	O	O			✓	O	✓	✓	O	O	O
Saw, cut-off, abrasive					O	O		O	O			O		O	O	O			O	O				O	O
Shear, beverly		✓	✓		O				O			O	O	O	O	O								O	
Shear, electric (portable)				O	O												O	O						O	
Shear, squaring	✓			✓	O				O								✓	✓						O	
Stakes, c/w universal holder	O			✓	O				O								✓	✓						O	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•								•	•
EQUIPMENT	Materials Testing	Metallurgy Fundamentals	Gas Tungsten Arc Welding	Specialized Welding	Arc Welding 3	Arc Welding 4	Pipe & Tubular Welding	Automated Welding	Sheet Fabrication 4	Sheet Fabrication 5	Foundry 3	Precision Turning 2	Precision Milling 2	CNC Milling	Prefabrication Principles	Gas Metal Art Welding 2
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3110	3120	3130	3140	3150	3160	3170
Lathe, metal, c/w accessories											O	✓			O	
Mill, CNC, C/W accessories													O	✓	O	
Mill, vertical, c/w accessories											O	O	✓		O	
Notcher									O	O					O	
Roll, slip									✓	✓					O	
Rotary, machine and rollers									✓	O					O	
Saw, band, comb. horizontal/vertical	O	O	O	O	O	O	O	O			O	O	O	O	O	O
Saw, cut-off, abrasive	O	O	O	O	O	O	O	O			O	O	O	O	O	O
Shear, beverly	O		O	O	O	O		O							O	O
Shear, electric (portable)															O	
Shear, squaring									✓	✓					O	
Stakes, c/w universal holder									✓	✓					O	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	B	B	B	C	C	C	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTION FACILITIES	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•		•	•					•	•	•	•	•	•								•	
EQUIPMENT	Basic Tools & Materials	Oxyacetylene Welding	Basic Electric Welding	Sheet Fabrication 1	Fabrication Principles	Bar & Tubular Fabrication	Foundry 1	Principles of Machining	Production Systems	Structural Engineering	Print Reading	Oxyfuel Welding	Thermal Cutting	Arc Welding 1	Arc Welding 2	Gas Metal Arc Welding 1	Sheet Fabrication 2	Sheet Fabrication 2	Forging Fundamentals	Foundry 2	Precision Turning 1	Precision Milling 1	CNC Turning	Custom Fabrication	Pipe Fitting
	CON	1040	1050	1090	1100	1110	1120	1130	1160	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Table, forming	✓			✓	O	✓			O								✓	✓						O	
Table, layout	O			✓	O	✓			✓	O	O						✓	✓						O	
Table, welding		✓	✓		O	✓			O			✓	✓	✓	✓	✓								O	
Tap & die set (NC/NF, met/imp)	O				✓	✓	O	✓	O	O									O		✓	✓	✓	O	
Threader, pipe					O																			O	✓
Vise, machinist	✓	✓	O	✓	✓	✓	✓	✓	O	O		O	O	O	O	O	O	O	✓	O	✓	✓	✓	O	✓
Welder, GMAW, c/w accessories			✓		O	O			O							✓	O	O						O	
Welder, GTAW, c/w accessories																								O	
Welder, OAW, c/w accessories		✓			O	O			O			✓	✓						O					O	
Welder, SMAW, c/w accessories		✓	O			O			O					✓	✓									O	
Welder, spot	O	O	✓	O	O				O								O	O						O	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FABRICATION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Materials & Structures
B. Fabrication Processes
C. Production Systems & Processes

EQUIPMENT
✓ Recommended
○ Optional

EQUIPMENT	Materials Testing 3010	Metallurgy Fundamentals 3020	Gas Tungsten Arc Welding 3030	Specialized Welding 3040	Arc Welding 3 3050	Arc Welding 4 3060	Pipe & Tubular Welding 3070	Automated Welding 3080	Sheet Fabrication 4 3090	Sheet Fabrication 5 3110	Foundry 3 3120	Precision Turning 2 3130	Precision Milling 2 3140	CNC Milling 3150	Prefabrication Principles 3160	Gas Metal Art Welding 2 3170
LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	B
INSTRUCTIONAL QUALIFICATIONS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•								•	•
Table, forming									✓	✓						
Table, layout									✓	✓					○	
			✓	✓	✓	✓	✓								○	✓
Tap & die set (NC/NF, met/imp)												✓		✓		
Threader, pipe															○	
Vise, machinist	✓						✓				○	✓	✓		○	○
Welder, GMAW, c/w accessories				○			○		○	○					✓	✓
Welder, GTAW, c/w accessories			✓													
Welder, OAW, c/w accessories				○												
Welder, SMAW, c/w accessories				○			○									
Welder, spot									○	○						

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Fashion Studies

Facilities
Some modules in Fashion Studies can be delivered in a typical classroom setting. Others require access to more specialized facilities, such as:

- adequate electrical services to accommodate the number of sewing machines available
- adequate space for fabric/pattern layout and equipment available
- access to computers and appropriate software.

Also desirable, though not essential, are instructional facilities that have:

- water and a sink
- a changing/fitting room.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules.

Equipment for modules in Fashion Studies can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations
Safety with respect to the use of equipment (i.e., sewing machines, scissors, iron) will be important in the production theme. In addition, it is also important to monitor supplies and equipment and to have a means of security for student project storage.

Instructional Qualifications
Responsibility for instructional planning and delivery of courses in Fashion Studies will be assumed by Alberta Certified Teachers having instructional expertise in the area of Home Economics (Clothing and Textiles), Design and/or Merchandising. A background in clothing construction, flat pattern and pattern drafting will be an asset to those who provide instruction in Fashion Studies modules in the production theme. Computer expertise will be an asset, particularly in offering the two *Computer Drafted Pattern* modules.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
No credentialling opportunities have been identified for the Fashion Studies modules.

Module Parameters Chart

FASHION STUDIES

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Production
B. Design
C. Merchandising

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
THEME	A	A	A	A	A	B	B	B	B	A	A	A	A	A	A	A	A	C	A	A	B	B	A	A	A	B	A	A	C
INSTRUCTIONAL QUALIFICATIONS																													
INSTRUCTIONAL FACILITIES	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•		•	•			•	•	•		•	•	
CREDENTIALLING OPPORTUNITIES																													
EQUIPMENT	Ready, Set, Sew!	Fashion Basics	Repair & Recycle	Creating Accessories 1	Creative Yarns/Textiles	Fashion Dynamics	Fashion Illustration 1	CAD Patterns 1	Evolution of Fashion	Flat Pattern	Pattern Drafting 1	Creative Construction	Activewear	Specialty Fabrics 1	Sewing for Others	Creating Home Decor	Surface Embellishment	Fashion Merchandising	Upholstery	Creating Accessories 2	Fashion Illustration 2	CAD Patterns 2	Pattern Drafting 2	Contemporary Tailoring	Couture	Creators of Fashion	Cultural Fashions	Specialty Fabrics 2	Fashion Retailing
	1030	1040	1050	1060	1070	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2140	2150	2160	3010	3020	3030	3040	3060	3070	3080	3090	3140
Cabinets/Specialized tables	O	O	O	O						O	O	O	O	O	O	O	O						O	O	O		O	O	
Computer	O	O	O	O	O	O	O	✓	O	O	O	O	O	O	O	O	O	O	O	O	O	✓	O	O	O	O	O	O	O
Iron & ironing boards	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	O						✓	✓	✓		✓	O	
Printer/Plotter								✓	O	O	O	O	O	O	O	O	O	O			O	✓	O	O	O	O	O	O	O
Serger	✓	✓	✓	✓	O					✓	✓	✓	✓	✓	✓	✓	✓		O	✓			✓	✓	✓		✓	✓	
Sewing machines	✓	✓	✓	✓	O					✓	✓	✓	✓	✓	✓	✓	✓		O	✓			✓	✓	✓		✓	✓	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters for Foods

Facilities

CTS programs centered around Foods should include modules that link with facilities that are readily available in the school and/or community. All Foods modules require a food preparation (either personal or commercial) facility; the type of facility required for the Foods strand will be determined by the contextual application of the modules. Programs which focus on a personal application as the context for learning may be offered in a facility with equipment typically found in a household kitchen. However, programs which focus on a commercial application will require access to a commercial facility and commercial equipment.

When selecting or planning a facility for Foods ensure that there is:

- adequate space for instruction
- adequate services to run the equipment
- ample storage areas for equipment, tools and supplies
- dry and refrigerated storage
- adequate ventilation
- access to water and adequate plumbing services
- appropriate ambient features
- appropriate safety features.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules. The equipment that is essential only in a commercial facility is identified with an asterisk (R*). The equipment required varies according to the contextual application of the modules. All other equipment included in the list is either recommended or optional in modules offered in either a personal or a commercial context.

Equipment for modules in Foods can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations

The maintenance of a safe and sanitary learning/working environment is everyone's concern in a facility supporting a Foods program. A number of safety issues exist:

- the layout of the laboratory
- the number of students in the laboratory setting
- laboratory management
- the maintenance and use of equipment and tools
- sanitary and hygienic food handling and storage
- personal hygienic practices
- federal, provincial and local food regulations.

In addition, it is also important to formulate a plan to monitor food inventory and supplies.

Instructional Qualifications
Responsibility for instructional planning and delivery of courses in Foods will be assumed by Alberta Certified Teachers having instructional expertise in the area of Home Economics (Foods) and/or Food Preparation. If the module is offered in a commercial context, with the use of commercial equipment, journeyman status is strongly recommended. The module *Basic Meat Cutting* requires meat cutting experience and/or certification in meatcutting to teach.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Students may earn credentials recognized by business, industry and post-secondary institutions by demonstrating a specific set of competencies. Certification opportunities that meet the requirements of Section 43 of the Public Health Act Food Regulation for "Food Safety and Sanitation" is being explored.

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

FOODS

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

	Food Basics	Baking Basics	Snacks & Appetizers	Meal Planning 1	Fast & Convenience Foods	Canadian Heritage Foods	Food & Nutrition Basics	Nutrition & The Athlete	Food Decisions & Health	Cake & Pastry	Yeast Breads & Rolls	Milk Products & Eggs	Stocks, Soups & Sauces	Vegetables/Fruits/Grains	Creative Cold Foods	Basic Meat Cookery	Fish & Poultry	Meal Planning 2	Vegetarian Cuisine	Rush Hour Cuisine	Food Safety & Sanitation	Food Venture	International Cuisine 1
LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	A	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS										•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•			•	•	•			•	•	•	•	•	•	•	•		•		•		•
EQUIPMENT	1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170
Baker's table		O								O	C												
Bun divider											C												
Cabinet, proofer hot & cold		O									C												
Computer	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Cookware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Deep fat fryer													C	C		C	C						
Dehydrator																							
Demonstration table	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Dinnerware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flatware	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Grill Top												C	C	C		C	C						

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FOODS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS			*	*	*	*	*	*	*	*	*	*	*	*
INSTRUCTIONAL FACILITIES	*	*	*	*	*	*	*	*	*	*	*	*	*	*
CREDENTIALLING OPPORTUNITIES			*	*	*	*	*	*	*	*	*			*
EQUIPMENT	Food for the Life Cycle 3010	Nutrition & Digestion 3020	Creative Baking 3030	Advanced Yeast Products 3040	Advanced Soups & Sauces 3050	Food Presentation 3060	Short Order Cooking 3070	Advanced Meat Cookery 3080	Basic Meat Cutting 3090	Entertaining with Food 3100	Food Processing 3110	Food Evolution/Innovation 3120	The Food Entrepreneur 3130	International Cuisine 2 3140
Baker's table			C	C										
Bun divider														
Cabinet, proofer hot & cold				C										
Computer	O	O	O	O	O	O	O	O		O	O	O	O	O
Cookware	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Deep fat fryer							✓	O						
Dehydrator											O			
Demonstration table	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Dinnerware	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Flatware	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Grill Top							✓	C						

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

FOODS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	A	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS										•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•			•	•	•			•	•	•	•	•	•	•	•		•		•		•
EQUIPMENT	Food Basics	Baking Basics	Snacks & Appetizers	Meal Planning 1	Fast & Convenience Foods	Canadian Heritage Foods	Food & Nutrition Basics	Nutrition & The Athlete	Food Decisions & Health	Cake & Pastry	Yeast Breads & Rolls	Milk Products & Eggs	Stocks, Soups & Sauces	Vegetables/Fruits/Grains	Creative Cold Foods	Basic Meat Cookery	Fish & Poultry	Meal Planning 2	Vegetarian Cuisine	Rush Hour Cuisine	Food Safety & Sanitation	Food Venture	International Cuisine 1
	1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170
Ice maker															C								
Knife Set	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Meat Bandsaw																							
Meat Block																O							
Meat Grinder																							
Meat Hook Racks																							
Meat Slicer															C								
Mixer, 30 qt.		O								C	C				C								
Mobile Utility Cart										O	C	O	C	O	O	C	O					C	
Pot storage racks													O	O		O	O						
Range/Oven/Microwave	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FOODS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES			•	•	•	•	•	•	•	•	•			•
EQUIPMENT	Food for the Life Cycle 3010	Nutrition & Digestion 3020	Creative Baking 3030	Advanced Yeast Products 3040	Advanced Soups & Sauces 3050	Food Presentation 3060	Short Order Cooking 3070	Advanced Meat Cookery 3080	Basic Meat Cutting 3090	Entertaining with Food 3100	Food Processing 3110	Food Evolution/Innovation 3120	The Food Entrepreneur 3130	International Cuisine 2 3140
Ice maker														
Knife Set	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Meat Bandsaw									✓					
Meat Block								C	✓					
Meat Grinder									✓					
Meat Hook Racks									✓					
Meat Slicer							✓		✓					
Mixer, 30 qt.														
Mobile Utility Cart			C	C	C	C	C	C						
Pot storage racks			O	O	O		O	O						
Range/Oven/Microwave	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FOODS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	B	C	C	D	A	A	A	B	B	B	B	B	B	B	B	C	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS										•	•	•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•			•	•	•		•	•	•	•	•	•	•	•	•		•		•		•
EQUIPMENT	Food Basics	Baking Basics	Snacks & Appetizers	Meal Planning 1	Fast & Convenience Foods	Canadian Heritage Foods	Food & Nutrition Basics	Nutrition & The Athlete	Food Decisions & Health	Cake & Pastry	Yeast Breads & Rolls	Milk Products & Eggs	Stocks, Soups & Sauces	Vegetables/Fruits/Grains	Creative Cold Foods	Basic Meat Cookery	Fish & Poultry	Meal Planning 2	Vegetarian Cuisine	Rush Hour Cuisine	Food Safety & Sanitation	Food Venture	International Cuisine 1
	1010	1020	1030	1040	1050	1060	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170
Refrigeration, cart shelf units									O	O	O	O	O	O	O	O	O						
Refrigerator/Freezer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scale, portion										C	C		C	C	C	C							
Small Electric Appliances	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Steam Cooker														C									
Steam Kettle												C	C	C									
Vegetable cooker														O									
Washer/Dryer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Work table/Counter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

FOODS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Nutrition
B. Preparation & Presentation
C. Management
D. Social & Cultural

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	B	B	B	B	C	C	C	C	D
INSTRUCTIONAL QUALIFICATIONS			•	•	•	•	•	•	•	•	•	•	•	•
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES			•	•	•	•	•	•	•	•	•			•
EQUIPMENT	Food for the Life Cycle	Nutrition & Digestion	Creative Baking	Advanced Yeast Products	Advanced Soups & Sauces	Food Presentation	Short Order Cooking	Advanced Meat Cookery	Basic Meat Cutting	Entertaining with Food	Food Processing	Food Evolution/Innovation	The Food Entrepreneur	International Cuisine 2
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140
Refrigeration, cart shelf units			O	O	O	O	O	O	O	O	O	O	O	O
Refrigerator/Freezer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scale, portion			C	C	C			C						
Small Electric Appliances	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Steam Cooker											✓			
Steam Kettle					C									
Vegetable cooker					O		O	O			O			
Washer/Dryer	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Work table/Counter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Forestry

Facilities

Some modules in the Forestry scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- woodlots and/or demonstration forests
- science, design, construction, fabrication and mechanics laboratories
- observation and training sites sponsored by relevant industry, government and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- lighting capabilities conducive to horticulture
- an exterior exit
- telephone service.

Modules that require access to facilities not present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

An equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the expectations of the modules.

Equipment for modules in Forestry can be obtained through a combination of purchasing, borrowing, renting improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations

Facilities used to support a Forestry program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and establish appropriate personal and environmental health and safety procedures in modules that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- outdoor trips and field-based investigations

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

Instructional Qualifications
Courses in Forestry can be implemented by Alberta Certified Teachers who have an interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science and/or forest industry will be an asset to those who provide instruction in Forestry modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from forest industry, professional forestry associations and consultants, and relevant government agencies (e.g., Alberta Environmental Protection).

To ensure compliance with safety and industrial standards, some modules require that components of instruction be provided by a person(s) having additional credentials granted by business, industry, government or community organizations. Forestry modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
Some modules within the Forestry strand provide opportunities for students to earn credentials recognized by business, industry and/or post-secondary institutions. Modules that link with credentialling opportunities relevant to the forestry sector are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

FORESTRY

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3
THEME	A	A	A	B	B	C	C	A	A	A	B	B	C	C	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS			•							•											
INSTRUCTIONAL FACILITIES			•	•	•	•				•	•								•	•	
CREDENTIALLING OPPORTUNITIES			•							•											
EQUIPMENT	Why Forestry?	Forest Regions of Canada	Woods Survival 1	Mapping & Aerial Photos	Measuring the Forest 1	Forest Ecology 1	Forests Forever 1	Making a Difference	Managing Alberta's Forests	Woods Survival 2	Measuring the Forest 2	Harvest Practices	Forests Forever 2	Users in the Forest	Issues in Forestry	Measuring the Forest 3	The Forest Marketplace	Forest Technology Applications	Forest Ecology 2	Silviculture	Integrated Resource Management
	1010	1020	1040	1050	1060	1090	1100	2010	2030	2040	2060	2070	2100	2120	3010	3060	3070	3080	3090	3110	3120
Binoculars			O		O					O	O										
Calculator				✓	✓	O		O		O	✓			O		✓			O		✓
Camcorder							O	O				O						O	O		
Camera			O		O		O	O		O	O	O						O	O		
Camping gear (1)			✓							✓											
Canoe			O							O											
Chainsaw										O		O									
Clinometer					✓						✓								O		
Compass			✓	✓	✓					✓						O			O		
Computers & software							O	O								O					
Container trays																				✓	
Douglas protractor				✓										O		O					O
First aid supplies			✓		✓	✓				✓	✓							O	✓		

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

FORESTRY

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3
THEME	A	A	A	B	B	C	C	A	A	A	B	B	C	C	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS			•							•											
INSTRUCTIONAL FACILITIES			•	•	•	•				•	•								•	•	
CREDENTIALLING OPPORTUNITIES			•							•											
EQUIPMENT	Why Forestry?	Forest Regions of Canada	Woods Survival 1	Mapping & Aerial Photos	Measuring the Forest 1	Forest Ecology 1	Forests Forever 1	Making a Difference	Managing Alberta's Forests	Woods Survival 2	Measuring the Forest 2	Harvest Practices	Forests Forever 2	Users in the Forest	Issues in Forestry	Measuring the Forest 3	The Forest Marketplace	Forest Technology Applications	Forest Ecology 2	Silviculture	Integrated Resource Management
	1010	1020	1040	1050	1060	1090	1100	2010	2030	2040	2060	2070	2100	2120	3010	3060	3070	3080	3090	3110	3120
Increment borer					✓																
Kit, soil testing																			✓		
Maps, forestry (2)		O	✓	✓						✓				✓		✓			O		
Outdoor gear (3)		✓	✓		✓					✓								O	✓	✓	
Personal safety equipment (4)		✓	✓	✓	✓	✓				✓	✓	✓						O	✓	✓	
Photos, aerial			✓	✓						✓				O		✓			O		
Planting bags/pails											✓									✓	
Planting tools (5)																				O	
Polychord chain					✓														O		
Pruning tools																				✓	
Riker (permanent display) mounts		O		✓		✓	O						✓						O		
Saw			✓							✓											
Seedlings, bare root & container grown																				✓	

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

FORESTRY

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3
THEME	A	A	A	B	B	C	C	A	A	A	B	B	C	C	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS			•							•											
INSTRUCTIONAL FACILITIES			•	•	•	•				•	•								•	•	
CREDENTIALLING OPPORTUNITIES			•							•											
EQUIPMENT	Why Forestry?	Forest Regions of Canada	Woods Survival 1	Mapping & Aerial Photos	Measuring the Forest 1	Forest Ecology 1	Forests Forever 1	Making a Difference	Managing Alberta's Forests	Woods Survival 2	Measuring the Forest 2	Harvest Practices	Forests Forever 2	Users in the Forest	Issues in Forestry	Measuring the Forest 3	The Forest Marketplace	Forest Technology Applications	Forest Ecology 2	Silviculture	Integrated Resource Management
	1010	1020	1040	1050	1060	1090	1100	2010	2030	2040	2060	2070	2100	2120	3010	3060	3070	3080	3090	3110	3120
Shovel																			✓	✓	
Slides/specimens, tree (6)		✓		✓			○						✓						✓		
Snowshoes			○							○											
Stereoscope				✓										○		○					
Table, drafting				○												○					
Tape - 30m					✓						✓								✓		
Tape - diameter					✓						✓										
Tape - flagging					✓														✓		
X-country skis			○							○											

(1) Camping gear includes tent, campstove, sleeping bag, cooking utensils, lantern, knife, sanitary supplies, personal grooming items

(2) Maps include forest cover, forest stand, topographic, forest regions, administrative boundaries, green and white areas

(3) Outdoor gear includes bush clothing, backpack, outdoor boots and raingear as required

(4) Personal safety items include hard hat, safety glasses, ear protectors, pressure and triangular bandages as required

(5) Planting tools include mattock and planting shovel

(6) Specimens may include forest disease, forest insect, wood products, cones, seeds and other tree parts

*** Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.**

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Module Parameters for Information Processing

Facilities
CTS programs centred around Information Processing should include modules that link with facilities that are readily available in the school and the community. When selecting or planning a facility for Information Processing, ensure:

- adequate space for instruction
- adequate services to run the equipment
- hardware and software appropriate for program, especially for modules selected at the advanced level
- a resource centre that includes storage for print and audio-visual materials.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules. Specific makes and models of equipment are to be determined at the local level.

Equipment for modules in Information Processing can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Instructional Qualifications
Responsibility for instructional planning and delivery of courses in Information Processing will be assumed by Alberta Certified Teachers having instructional expertise in classroom and laboratory environments. Business and industry training or experience will be an asset in delivering Information Processing modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to form partnerships with local businesses.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
No credentialling opportunities have been identified for the Information Processing modules.

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Module Parameters Chart

INFORMATION PROCESSING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. System Operations
B. Text/Data Input
C. Productivity Software
D. Applied Processing
E. Dynamic Environment
F. Object-Oriented, Procedure-Oriented Programming

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	B	C	C	C	C	E	F	E	A	B	B	C	C	C	C	D	D	D	D	E	E	F	F	F	F	A	E
INSTRUCTIONAL QUALIFICATIONS																												
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																												
EQUIPMENT	Computer Operations	Keyboarding 1	Word Processing 1	Graphics Tools	Database 1	Spreadsheet 1	Hypermedia Tools	Programming 1	Information Highway 1	Workstation Operations	Keyboarding 2	Keyboarding 3	Word Processing 2	Electronic Publishing 1	Database 2	Spreadsheet 2	Correspondence	Reports	Tables/Forms	Software Integration 1	Multimedia Authoring 1	Process Control	Programming 2	Programming 3	Programming 4	Programming 5	Telecommunications 1	Information Highway 2
	1010	1020	1030	1040	1050	1060	1070	1080	1090	2010	2030	2040	2050	2060	2070	2080	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
CD-ROMs	○									○																		
Computer station CPU keyboard monitors, related software, ratio 1:1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Computer station furniture (table, chair, copy stand)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Internet Access									✓	○											○						✓	✓
Laptops										○																		
Network capability									✓	○											○	○						
Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scanner										○											○							
Voice input capabilities										○											○						○	○

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

INFORMATION PROCESSING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. System Operations
B. Text/Data Input
C. Productivity Software
D. Applied Processing
E. Dynamic Environment
F. Object-Oriented, Procedure-Oriented Programming

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	A	A	B	B	B	C	C	C	D	D	D	D	E	E	F	F	F	A	E	E
INSTRUCTIONAL QUALIFICATIONS																				
INSTRUCTIONAL FACILITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES																				
EQUIPMENT	Hardware/Software Analysis	Local Area Networks	Keyboarding 4	Keyboarding 5	Keyboarding 6	Word Processing 3	Electronic Publishing 2	Information Management Tools	Software Integration 3	Specialization 1	Specialization 2	Software Integration 2	Multimedia Authoring 2	Expert Systems	Programming Application 1	Programming Application 2	Programming Application 3	Telecommunications 2	Information Highway 3	Internet Services
	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200
CD-ROMs	○	○																		
Computer station CPU keyboard monitors, related software, ratio 1:1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Computer station furniture (table, chair, copy stand)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Internet Access	○	○																✓	✓	✓
Laptops	○	○																		
Network capability		✓										○	○	○			○	✓	✓	✓
Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Scanner	○	○				✓	○						○	○						
Voice input capabilities	○	○											○							

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Management and Marketing

Facilities

CTS programs centred around Management and Marketing should include modules that link with facilities that are readily available in the school and the community. When planning facilities for a Management and Marketing course, decisions regarding the following should be given consideration:

- use of school store as a lab for many of the learnings within the marketing systems and strategies modules
- installation of a 3 basin sink if serving food in a school store
- access to telephones for purchasing and ordering merchandise
- use of existing in-school laboratories and/or equipment (e.g. information processing, construction, design, fabrication and communications)
- use of computer technology within the classroom for all modules, but in particular the promotional modules in the marketing theme and the Communication Strategies modules in the Information Management theme
- identification of in-school window displays for visual merchandising or construction of shadow boxes for use in classroom
- linkages to the business community to deliver content
- storage area for inventory, props and supplies
- a resource centre that includes computer hardware/software, as well as storage for print and audio-visual material.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment

A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules. Note that a school store is not required for a Management and Marketing program; equipment for a school store will be listed as optional. Specific makes and models of equipment are to be determined at the local level.

Equipment for modules in Management and Marketing can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Instructional Qualifications

Responsibility for instructional planning and delivery of courses in Management and Marketing will be assumed by Alberta Certified Teachers having instructional expertise in classroom and laboratory environments. Business training or experience will be an asset in delivering Management and Marketing modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to form partnerships with local businesses.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities
No credentialling opportunities have been identified for the Management and Marketing modules.

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Module Parameters Chart

MANAGEMENT AND MARKETING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems & Strategies
B. Marketing Systems and Strategies
C. Information Management Systems & Strategies

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility – School Store

LEVEL	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
THEME	B	B	C	A	B	B	B	C	C	C	A	A	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS																			
INSTRUCTIONAL FACILITIES			•					•	•								•	•	•
CREDENTIALLING OPPORTUNITIES																			
EQUIPMENT	Management & Marketing Basics	Quality Customer Service	Communication Strategies 1	Managing for Quality	Promotion: Advertising	Promotion: Visual Merchandising	Retail Operations	Office Systems 1	Communication Strategies 2	Records Management 1	The Business Organization	Business in the Canadian Economy	Business in the Global Marketplace	Promotion: Sales Techniques	Distributing Goods & Services	Setting Up a Retail Store	Office Systems 2	Communication Strategies 3	Records Management 2
	1010	1020	1030	2010	2020	2030	2040	2050	2060	2080	3010	3020	3030	3040	3050	3060	3070	3080	3090
3 Basin Sink (if serving food)		✓																	
Cash register		C												O					
Computer/Printer	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Computerized inventory tracking		O					O												
Counter		C				O								O					
Display area																			
windows		O				O								O					
shelves		O				O								O					
Dressing room		O												O					
Electronic calculator		O					✓												
Electronic signboard		O			O	O								O					
Filing cabinet	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MANAGEMENT AND MARKETING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems & Strategies
B. Marketing Systems and Strategies
C. Information Management Systems & Strategies

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility – School Store

LEVEL	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
THEME	B	B	C	A	B	B	B	C	C	C	A	A	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS																			
INSTRUCTIONAL FACILITIES			•					•	•								•	•	•
CREDENTIALLING OPPORTUNITIES																			
EQUIPMENT	Management & Marketing Basics	Quality Customer Service	Communication Strategies 1	Managing for Quality	Promotion: Advertising	Promotion: Visual Merchandising	Retail Operations	Office Systems 1	Communication Strategies 2	Records Management 1	The Business Organization	Business in the Canadian Economy	Business in the Global Marketplace	Promotion: Sales Techniques	Distributing Goods & Services	Setting Up a Retail Store	Office Systems 2	Communication Strategies 3	Records Management 2
	1010	1020	1030	2010	2020	2030	2040	2050	2060	2080	3010	3020	3030	3040	3050	3060	3070	3080	3090
Hand code scanner		O					O												
Interior display island																			
end		O				O								O					
platform		O				O								O					
shadow box		O				O								O					
Laminator		O			O	O								O					
LAN		O					O												
Mannequin		O			O														
Mirrors		O												O					
Modem/Internet connection	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Office desk/chair/lounge	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Portable billboard		O			O	O								O					

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

MANAGEMENT AND MARKETING

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Business Management Systems & Strategies
B. Marketing Systems and Strategies
C. Information Management Systems & Strategies

EQUIPMENT
✓ Recommended
O Optional
C Commercial Facility – School Store

LEVEL	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3
THEME	B	B	C	A	B	B	B	C	C	C	A	A	A	B	B	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS																			
INSTRUCTIONAL FACILITIES			•					•	•								•	•	•
CREDENTIALLING OPPORTUNITIES																			
EQUIPMENT	Management & Marketing Basics	Quality Customer Service	Communication Strategies 1	Managing for Quality	Promotion: Advertising	Promotion: Visual Merchandising	Retail Operations	Office Systems 1	Communication Strategies 2	Records Management 1	The Business Organization	Business in the Canadian Economy	Business in the Global Marketplace	Promotion: Sales Techniques	Distributing Goods & Services	Setting Up a Retail Store	Office Systems 2	Communication Strategies 3	Records Management 2
	1010	1020	1030	2010	2020	2030	2040	2050	2060	2080	3010	3020	3030	3040	3050	3060	3070	3080	3090
Scanner	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Sign printer		O			O	O								O					
Stockroom		O				O	O												
cooler/fridge/freezer		O																	
signs		O																	
Telephone	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	✓	O	O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters for Mechanics

Facilities
Several modules in the Mechanics scope and sequence can be delivered in a typical classroom setting. The majority require access to more specialized in-school and off-campus facilities, such as:

- space for vehicle work stations, overhead doors and hoists
- space for instruction and resources
- space for equipment and tool storage
- provision for exhaust/fume/dust extraction (depending on modules chosen)
- provision for water, drainage and electrical services.

Also desirable, though not essential, are instructional facilities that have:

- whiteboards, bulletin boards and display cabinets
- access to a compound to store vehicles
- communication service – telephone, computer/modem and networking.

Modules that require access to facilities in addition to those present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Most modules in Mechanics – those identified with an "X" – require special facilities to accommodate instruction and maintenance of vehicles. Facilities will vary according to the type of vehicles use for instruction and the modules undertaken.

Equipment
A recommended equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies equipment recommended as necessary to meet the expectations of the modules when utilizing the automobile as the vehicle. Make and models of equipment need to be determined locally.

Equipment for modules in Mechanics can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing.

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety and Security Considerations
Maintaining a safe and secure environment is essential when delivering a Mechanics program. The following issues need to be addressed:

- establish laboratory/shop management procedures
- provision for electrical power lockout in the absence of teacher/facilitator
- procedures for proper use of tools and equipment
- procedures to follow when an accident occurs
- preventative accident/equipment maintenance program
- safe laboratory/shop equipment layout.

Instructional Qualifications

Facilitation of the Mechanics program will require teachers having expertise in classrooms as well as lab/shop settings. Trade training and experiences are essential for many modules. For students seeking apprenticeship articulation, instruction must be provided by teachers with trade qualifications such as a journeyman certificate. To ensure compliance with industry safety standards, selected modules in brakes, steering and suspension will require supervision by a journeyman when work is performed on road licensed vehicles.

Modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each teacher/instructor credential.)

Credentialling Opportunities

Students may earn credentials recognized by industry and post-secondary institutions by demonstrating a specific set of competencies. Modules requiring additional teacher/instructor credentials are identified in the module parameter chart relevant to the Automotive Service Technician trade. (See the corresponding modules in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.

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Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A
INSTUCTIONAL QUALIFICATIONS												•
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020
Basic set of hand tools	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air compressor		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Air impact tool												O
Battery charger	O	✓		O								✓
Brake (sheet metal)	O							O				
Brake, lathe												
Brake, vacuum (asbestos)		O					O					O
Cleaner, hot tank			O									
Computer/printer/modem	✓	O	O	O	O	O	O	O				O
Drill press (bench)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drill set (met/imp)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

LEVEL	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Basic set of hand tools	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air compressor	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air impact tool									O	✓	O	O	O	O
Battery charger														
Brake (sheet metal)														✓
Brake, lathe								✓						
Brake, vacuum (asbestos)								✓						
Cleaner, hot tank														
Computer/printer/modem				O	O	O	O	O	O	O	O	O	O	
Drill press (bench)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Drill set (met/imp)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Basic set of hand tools	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Air compressor		✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓			✓
Air impact tool										O	O	O						O	O	O								
Battery charger																												
Brake (sheet metal)																							✓	✓				
Brake, lathe																												
Brake, vacuum (asbestos)																												
Cleaner, hot tank											✓	✓																
Computer/printer/modem			O			O	O	✓	✓				O	✓	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Drill press (bench)					O						✓	✓					O		O									
Drill set (met/imp)		O			O						✓	✓					O		O									

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Drill, portable, heavy duty, variable speed, reversible	✓	✓	O	O	✓	✓	O	✓	✓	✓	O	✓	O	O	O	O	O	O	O	O	O	O	O	O	O	✓
Dust collection system									✓	✓																✓
Engine analyzer																										
Flusher, cooling system		O										O	✓													
Frame straightner																										
Grinder, portable angle					O		O		✓																	✓
Grinder, tool (bench)	✓	✓	O	O	O	O	O	O	O			✓	O	O	O	O	O	O	O	O	O	O	O	O	O	
Grinder, valve reface			O																							
Grinder, valve seat			O																							
Headlight, aimer		O										✓														

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	EngineReplacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Drill, portable, heavy duty, variable speed, reversible	○	○		✓	✓			○		○	✓	✓											✓	✓	✓	✓		
Dust collection system		✓		○																			✓	✓		✓		✓
Engine analyzer						○		✓	✓																			
Flusher, cooling system																												
Frame straightner																								✓				
Grinder, portable angle		○	○																				✓	✓		✓		○
Grinder, tool (bench)		○	○	○	○			○			✓	✓											○	○	○			
Grinder, valve reface											✓																	
Grinder, valve seat											✓																	
Headlight, aimer																												

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Hoist, auto, electric		○	○	○	○	○	○					○	○	○		○	○		○	○	○	○	○	○	○	
Hoist, engine			○																							
Honing maching																										
Hydrolauncher	○				○																					
Individual testers (i.e. battery, charging, infra-red, volt/ohm etc)		○		✓								✓	✓	✓		✓	✓	✓	✓							
Jack stands		✓	○	○	✓	✓	✓	✓	○			✓		○			○		○	○	○	○	○	○	○	
Jack, automotive (floor)		✓	○	○	✓	✓	✓	✓	○			✓	○	○			○		○	○	○	○	○	○	○	
Jacks, body & frame																										
Mask, fresh air									○																	✓
Mixer, paint									○																	○

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Hoist, auto, electric						O	O	O	O	O	O	O			O		O	O	O	✓	O	O						
Hoist, engine										✓	O	✓																
Honing maching											O	✓																
Hydrolauncher																												
Individual testers (i.e. battery, charging, infra-red, volt/ohm etc)								✓	✓					✓	✓	✓	✓											
Jack stands						O	O	O	O	✓	O	O			O	O	O	O	O	O	O	O	O	O				
Jack, automotive (floor)						O	O	O	O	✓	O	O			O	O	O	O	O	O	O	O	O	O				
Jacks, body & frame						O	O	O	O												O	O	O	O				
Mask, fresh air		O	O	O																					✓	O		✓
Mixer, paint			O	O																					✓	O		✓

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

MECHANICS

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Mobile lift (air operated)		○										○												○	○	
Nibbler								○	✓																	✓
Oil drain (mobile)		○	○		✓																					
Paper machine									○	○																
Polisher, portable		○									✓	○														
Press, arbor				○	○	○	○											○				✓	○	○	○	
Press, hydraulic																						○		✓		
Pump, car wash (high pressure washer)		○			○	○					✓	✓	○						○	○	○	○	○	○	○	
Raceway, manual start	○																									
Roller, forming	○							○	○																	✓
Sander, disc (portable)																										✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
○ Optional

	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Mobile lift (air operated)							○													○	○	○	○	○				
Nibbler																							✓	✓				
Oil drain (mobile)										○	○	○																
Paper machine			✓	○																					✓	✓		✓
Polisher, portable			○	✓																					✓			✓
Press, arbor											○	○						○										
Press, hydraulic																			✓	○								
Pump, car wash (high pressure washer)											○	○						✓	✓									
Raceway, manual start																												
Roller, forming																							✓	✓				
Sander, disc (portable)		✓																							✓	✓		✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

MECHANICS

EQUIPMENT
✓ Recommended
O Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxies	Suspension Systems	Steering Systems	Metal Repair & Finishing
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Sander, oscillating (portable)									O	O																✓
Shaker, paint									O																	O
Shear, squaring	O								O																	✓
Spray booth									O																	O
Spray gun									✓		O															✓
Storage tank, waste oil		✓	✓		O							✓	✓													
Tap and die et (NC/NF, met/imp)	O	✓	O	O	O	O		O	O			O				O	O	✓								✓
Tester, alternator				O														✓								
Tester, armature				O														✓								
Tester, circuit		O		✓								O						✓								
Tester, engine performance												O		✓		✓	✓									

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Sander, oscillating (portable)		✓	✓																						✓	✓		✓
Shaker, paint			✓	✓																					✓			✓
Shear, squaring																							✓	✓				
Spray booth			✓	O																					✓			✓
Spray gun			✓	✓																					✓			✓
Storage tank, waste oil																												
Tap and die et (NC/NF, met/imp)					O					O	O	O							O				O	O	✓		✓	
Tester, alternator								✓	✓																			
Tester, armature																												
Tester, circuit							O	✓	✓						✓	✓	✓											
Tester, engine performance							O	✓	✓																			

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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Module Parameters Chart

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

MECHANICS

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Tester, power steering																			✓							
Tire changer		○										✓												○	○	
Tire balancer		○										✓												✓	✓	
Trainer, electrical				○														○								
Trainer, fluid power					○																					
Trainer, mechanical						○																				
Vacuum cleaner	○	✓				○	○	✓			✓	✓														
Vise, machinist	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Washer, parts		○	○		○	○	○					○						○			○	○	○	○	○	
Welder, GMAW	○							✓	✓																	✓
Welder, GMAW, semi automatic									○																	○
Welder, oxyacetylene c/w accessories	○	○						✓	✓					✓						○						○

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Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
O Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Tester, power steering																	✓											
Tire changer																				O								
Tire balancer							O													✓								
Trainer, electrical																												
Trainer, fluid power																												
Trainer, mechanical																												
Vacuum cleaner																										✓		
Vise, machinist		O			O				O		✓	✓		O	O	O	O	O	O	O			O	O		O	O	
Washer, parts											✓	✓																
Welder, GMAW																												
Welder, GMAW, semi automatic																							✓	✓				
Welder, oxyacetylene c/w accessories																							✓	✓				

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

LEVEL
1 – Introductory
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THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
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D. Suspension and Structural Systems

MECHANICS

EQUIPMENT
✓ Recommended
O Optional

	Modes & Mechanisms	Vehicle Service & Care	Engine Fundamentals	Electrical Fundamentals	Pneumatics & Hydraulics	Mechanical Systems	Ride & Control Systems	Structures & Materials	Metal Forming & Finishing	Surface Preparation 1	Vehicle Detailing	Vehicle Maintenance	Lubrication & Cooling	Fuel & Exhaust Systems	Alternative Fuel Engines	Ignition Systems	Emission Controls	Electrical Components	Power Assist Accessories	Braking Systems	Hydraulic Accessories	Drive Trains	Transmissions/Transaxles	Suspension Systems	Steering Systems	Metal Repair & Finishing
LEVEL	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
THEME	A	A	B	C	C	C	D	D	D	D	A	A	B	B	B	B	B	C	C	C	C	C	C	D	D	D
INSTUCTIONAL QUALIFICATIONS												•							•	•				•	•	
INSTRUCTIONAL FACILITY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES		•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	
EQUIPMENT	1010	1020	1040	1090	1110	1130	1150	1160	1170	1190	2010	2020	2030	2040	2050	2060	2070	2090	2100	2110	2120	2130	2140	2150	2160	2170
Welder, spot	O								O																	✓
Wheel alignment (portable)												✓												O	O	
Wheel balancer		O										✓												✓	✓	
Zip gun									✓																	O

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

MECHANICS

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Vehicle Design & Ownership
B. Propulsion Systems
C. Guidance & Control Systems
D. Suspension and Structural Systems

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
THEME	D	D	D	D	D	A	A	B	B	B	B	B	B	C	C	C	C	C	C	D	D	D	D	D	D	D	D	D
INSTUCTIONAL QUALIFICATIONS															•	•		•					•	•				
INSTRUCTIONAL FACILITIES	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CREDENTIALLING OPPORTUNITIES								•	•	•	•	•							•	•								
EQUIPMENT	Trim Replacement	Surface Preparation 2	Refinishing 1	Touch-up & Finishing	Interior Repairs	Buying & Selling a Vehicle	Vehicle Value Appraisal	Engine Diagnosis	Engine Tune-ups	Engine Replacement	Engine Reconditioning 1	Engine Reconditioning 2	Alternative Energy Systems	Computer Systems	Safety Systems	Climate Control	Power Assisting	Automatic Transmissions	Drive Train Repair	Wheel Alignment	Body Repair Estimation	Damage Analysis	Damage Repair 1	Damage Repair 2	Refinishing 2	Plastic & Fibreglass	Glass Replacement	Refinishing 3
	2180	2190	2200	2210	2220	3010	3020	3030	3040	3050	3060	3070	3080	3090	3100	3110	3120	3130	3140	3150	3160	3170	3180	3190	3200	3210	3220	3230
Welder, spot																							✓	✓				
Wheel alignment (portable)																				✓								
Wheel balancer							○													✓								
Zip gun				✓																					✓			✓

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters for Wildlife

Facilities
Some modules in the Wildlife scope and sequence can be delivered in a typical classroom setting. Others require access to more specialized in-school and off-campus facilities, such as:

- outdoor environments (e.g., endangered spaces, forested areas, natural areas, protected areas, wetland areas)
- a science laboratory
- controlled environments for providing plant and/or animal care
- observation and training sites sponsored by relevant government, industry and/or post-secondary agencies
- resource centres equipped with computer hardware/software and audio-visual material.

Also desirable, though not essential, are instructional facilities that have:

- water and sinks
- display and storage areas for specimens and artifacts
- whiteboards/bulletin boards
- fresh air and fume extraction
- an exterior exit
- telephone service
- coolers and/or refrigeration

Modules that require access to facilities not present in a typical classroom setting are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each facility.)

Equipment
An equipment list has been provided in the module parameters chart. Though not exhaustive, the list identifies recommended and optional equipment for meeting the expectations of the modules.

Equipment for modules in Wildlife can be obtained through a combination of purchasing, borrowing, renting, improvising and constructing. When choosing a suitable option for obtaining equipment, give consideration to:

- adequacy of budgets for purchase
- capabilities regarding in-school maintenance and storage
- the logistics and cost of renting
- potential for loan from industry, government or post-secondary agencies
- joint purchases with other organizations in the community
- opportunities for improvising or constructing

Teachers will find it desirable to develop a list of additional materials and supplies required for specific learning activities planned within each module.

Safety Considerations
Facilities used to support a Wildlife program must ensure a safe learning/working environment. Students must be aware of federal, provincial and local regulations governing the tasks they perform, and establish appropriate personal and environmental health and safety procedures in modules that involve:

- the use of specialized hand/power equipment
- the handling and storage of hazardous materials
- outdoor trips and field-based investigations

Students must understand immediate and potential hazards associated with the tasks they perform, and the possible impact of these hazards on self, others and the environment.

Instructional Qualifications

Courses in Wildlife can be implemented by Alberta Certified Teachers who have interest in providing instruction in classroom, laboratory and/or outdoor environments. A background in science and/or natural resource management will be an asset to those who provide instruction in Wildlife modules, particularly at the intermediate and advanced levels. Teachers may find it desirable to access sources of instructional support available from relevant government agencies (e.g., Alberta Environmental Protection, Parks Canada), professional associations and consultants, and related industry (e.g., agriculture, forestry, tourism).

To ensure compliance with safety and industry standards, some modules require that components of instruction be provided by a person(s) having additional credentials granted by industry, government or community organizations. Wildlife modules requiring additional instructor credentials are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding each instructor credential.)

Credentialling Opportunities

Some modules within the Wildlife strand provide opportunities for students to earn either complete or partial credentials recognized by industry and/or post-secondary institutions. Modules that link with credentialling opportunities relevant to wildlife and the environmental sector are identified in the module parameters chart. (See the corresponding module in Section D, E or F of the *Guide to Standards and Implementation* for further information regarding the credential, requirement/qualification and credentialling agency.)

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Module Parameters Chart

WILDLIFE

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
B. Technology & Applications
C. Management & Conservation

EQUIPMENT
✓ Recommended
○ Optional

LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3
THEME	A	A	A	C	C	C	A	A	B	C	C	C	A	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS			•		•	•		•			•						
INSTRUCTIONAL FACILITIES			•		•	•		•			•			•			
CREDENTIALLING OPPORTUNITIES			•		•	•		•			•						
EQUIPMENT	What is Wildlife?	Natural History of Wildlife	Outdoor Experiences 1	Taking Responsibility	Hunting & Game Management 1	Angling & Fish Management	Measuring the Value	Outdoor Experiences 2	Wildlife Spaces & Species	Interactions	Hunting & Game Management 2	Issues in Wildlife 1	Making a Difference	Wildlife Research	Wildlife Management 1	Wildlife Management 2	Issues in Wildlife 2
	1010	1020	1030	1050	1070	1080	2020	2030	2040	2060	2070	2090	3020	3040	3050	3060	3090
Audio Recorder	○	○							○								
Binoculars	○	○	○					○	○								
Camcorder	○	○							○								
Camera	○	○							○								
Camping gear (1)			✓					✓									
Compass			✓					✓									
Computers & software				✓			✓										
First aid supplies			✓					✓									
Map (2)			✓					✓	○								
Microscope	✓	✓							✓								
Outdoor gear (3)			✓					✓									
Personal safety equipment (4)			○					○									

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

Module Parameters Chart

WILDLIFE

LEVEL
1 – Introductory
2 – Intermediate
3 – Advanced

THEME
A. Social & Cultural Perspectives
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EQUIPMENT
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LEVEL	1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3
THEME	A	A	A	C	C	C	A	A	B	C	C	C	A	B	C	C	C
INSTRUCTIONAL QUALIFICATIONS			•		•	•		•			•						
INSTRUCTIONAL FACILITIES			•		•	•		•			•			•			
CREDENTIALLING OPPORTUNITIES			•		•	•		•			•						
EQUIPMENT	What is Wildlife?	Natural History of Wildlife	Outdoor Experiences 1	Taking Responsibility	Hunting & Game Management 1	Angling & Fish Management	Measuring the Value	Outdoor Experiences 2	Wildlife Spaces & Species	Interactions	Hunting & Game Management 2	Issues in Wildlife 1	Making a Difference	Wildlife Research	Wildlife Management 1	Wildlife Management 2	Issues in Wildlife 2
	1010	1020	1030	1050	1070	1080	2020	2030	2040	2060	2070	2090	3020	3040	3050	3060	3090
Photos, aerial			✓					✓									
Riker (permanent display) mounts	✓	✓							✓								
Sampling tools (5)	✓	○							✓	✓							
Slides/specimens, plant & animal	✓	✓							✓								

(1) Camping gear includes tent, campstove, sleeping bag, cooking utensils, lantern, knife, saw, sanitary supplies, personal grooming items.
(2) Maps include topographic, climatic, ecosystem and soil type.
(3) Outdoor gear includes bush clothing, backpack, outdoor boots, rain gear, canoe, snowshoes, cross-country skis as required.
(4) Personal safety equipment includes hard hat, safety glasses, ear protectors, pressure and triangular bandages as required.
(5) Sampling tools include spade, traps and dip nets as required.

* Refer to specific modules listed in sections D, E and F of the corresponding *Guide to Standards and Implementation* for additional information.

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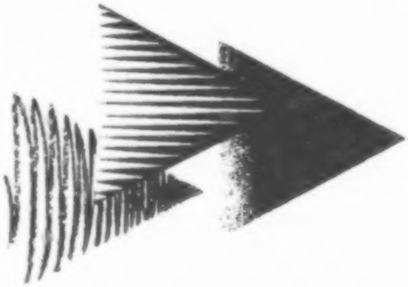

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 7:

CAREER PLANNING IN CTS

August 1997 (Interim)

CAREER PLANNING IN CTS

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PURPOSE

This document is targeted at two groups:

- ***school counsellors in their role of providing and supporting career counselling***
- ***CTS teachers in their role of supporting students in their career planning.***

The purpose of this document is to highlight strategies and resources school counsellors and CTS teachers can use to help students move through the CTS strands and modules in preparation for their transition to the workplace or post-secondary programs.

CTS Team
August 1997

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CAREER PLANNING IN CTS

INTRODUCTION

The Career and Technology Studies curriculum is designed for Alberta's junior and senior high school students. As a complementary program, CTS offers a modular, competency-based curriculum that helps all students:

- develop daily living skills
- explore a variety of career areas
- focus on selected careers or occupations helping them develop the skill sets they need to move into the workplace, or continue their studies in a related post-secondary program
- improve "employability" skills (CTS Basic Competencies).

See Section A of the CTS Manual for Administrators, Counsellors and Teachers *for more information on CTS curriculum structures and program features.*

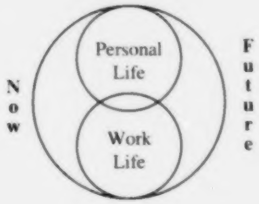
CTS will affect all students — those who plan and have the ability to enter university as well as those who will move from high school directly into the work force.

CTS curriculum has clearly defined standards that help focus on what the student is expected to KNOW and BE ABLE TO DO to succeed. The curriculum shifts the responsibility for learning to the student and reinforces the role of the teacher as "coach" who assists the student to meet the predefined standards.

"CAREERS" IN THE CTS CURRICULUM

In CTS, a "career" encompasses more than activities related to a person's job or occupation; it involves one's personal life in both local and global contexts; e.g., as a family member, a friend, a community volunteer, a citizen.

CAREERS



The CTS curriculum helps students' career planning in a variety of ways.

- Competencies related to career awareness and planning are defined within selected modules:
  - module learner expectations—specified exit level competencies that are required to complete a module
  - specific learner expectations—suggested learnings that help students develop the module learner expectations.
- Basic competencies, or employability skills, are integrated into each module — these basic competencies include skills related to effective career planning, such as decision making, enterprise and innovation (See Chart 2 for CTS Basic Competencies).

- Discrete modules in the Career Transitions strand help students develop the skills and documentation they need to enter the workplace
  - CTR1010: Job Preparation
  - CTR2010: Job Maintenance
  - CTR3010: Preparing for Change.
- Discrete modules in selected strands focus on career opportunities within that career area.

HOW DOES CTS DIFFER FROM OTHER CURRICULA?

CTS differs from other curricula in a number of ways.

- CTS is designed in smaller "chunks" of learning (modules) in order to allow:
  - more students to succeed more often
  - schools to have more flexibility in program design.

With the modules approach, curriculum developers can more readily revise curriculum and resources, deleting modules that are out of date or adding modules to incorporate new technologies or procedures.

- CTS is designed as a secondary program, accessible to Grades 7–12 students. Students from both junior and senior high school have access to the same set of modules.
- CTS is designed in levels, not grades:
  - introductory level modules are designed to develop daily living skills and form a solid foundation for further learning
  - intermediate level modules enhance career awareness and build on the competencies developed at the introductory level
  - advanced level modules are designed to meet standards of performance expected for entry into the workplace or related post-secondary programs.
- CTS recognizes prior learning and encourages assessing student performance and placing them in the strands or modules that offer new or enhanced learning challenges:
  - junior high and senior high students who have developed competencies in junior high should be able to build on those in senior high (learning as a continuum)
  - students may have developed CTS related competencies through part-time jobs, hobbies, volunteer work or family projects.

- Only modules successfully completed are reported on senior high transcripts.

CTS EXPANDS STUDENT ACCESS

With the flexible curriculum structure, **more** students can access **more** of the CTS program. Schools decide which CTS strands and modules students can access. This decision will depend on available school-based and community-based resources.

CTS promotes, but does not mandate, individualized instruction.

A wide range of delivery options are available, including:

- On-campus instruction:

  On-campus instruction is most frequently used when teachers and classrooms/labs are available and if enrollments are sufficient. Students' options are increased when:

  - teachers are able and willing to allow students some opportunity to select modules and progress at a rate that challenges them to succeed
  - timetables are flexible enough to access a wide range of strands and modules
  - distance delivery technologies and support materials are available. These can include using distance learning instructional materials prepared by developers such as the Alberta Distance Learning Centre and Distance Learning Options South. See Appendix 11 of the *CTS Manual for Administrators, Counsellors and Teachers* for the list of distance learning modules that are available.

See Appendix 9 of the CTS Manual for Administrators, Counsellors and Teachers *for a more detailed list of resources that support individualized instruction.*

- Off-campus learning:

  This option is used primarily to meet individual or small group learning needs. It involves establishing linkages with:

  - business/industry
  - post-secondary institutions
  - professional associations
  - community groups.

  Off-campus learning can be used to deliver a complete module or part of a module.

  The Model of Off-Campus Programs (Chart 6) shows how CTS can be offered with other programs in off-campus settings.

When a module has been delivered off-campus, use the related CTS course code NOT Work Experience 15, 25, 35.

CTS SUPPORTS WORKPLACE TRANSITIONS

The majority of students will move from high school and enter the work force. CTS strands and modules can help students build skill sets that make them more marketable in the workplace.

Chart 10 identifies the many occupational areas that the CTS strands support. As described in the National Occupational Classification system, some of these occupations can be accessed with varying levels of education:

- high school
- apprenticeship
- college or technical institute
- university.

Successful completion of CTS modules builds competencies that can be recognized in an apprenticeship program. Chart 8 identifies the apprenticeable trades that may link with the CTS modules.

In addition, through specified CTS strands and modules, students can earn credentials that are recognized in the workplace. These credentialling opportunities are summarized in Chart 7.

CTS SUPPORTS POST-SECONDARY TRANSITIONS

If students recognize that what they are learning in secondary schools helps them prepare for a range of career options, they are more likely to see the benefit and flexibility in developing an extensive competency base. By seeing the wide range of occupations available, students may be more flexible and more motivated to continue their education now or at a later time.

Chart 9 identifies post-secondary programs in Alberta that the CTS strands support. Post-secondary institutions have or are considering recognizing CTS strands and modules:

- as an entrance requirement
- for advanced placement
- for advanced credit.

CTS CONNECTS WITH RELATED PROGRAMS

CTS connects with core courses and other complementary courses as well as with the Integrated Occupation Program (IOP) and the Registered Apprenticeship Program (RAP).

IOP–CTS connections are addressed in Chart 5 and potential linkages with Alberta's Apprenticeship Trades are shown in Chart 8.

The potential connections with core and complementary programs are outlined in each *Guide to Standards and Implementation* (Section H) and Appendix 4 of the *CTS Manual for Administrators, Counsellors and Teachers*. The introduction to this Appendix is provided as Chart 3.

HOW CAN SCHOOL COUNSELLORS AND CTS TEACHERS WORK TOGETHER?

School counsellors and CTS teachers can form an effective partnership in helping students:

- expand their confidence that they can succeed
- assess a range of career and occupational opportunities
- identify and negotiate the best possible placements in the workplace or in related post-secondary programs.

The school counsellor's role is essential for student placement and program planning.

See Chart 1 for sample student planning form.

- Student Placement:
  - helping students map out their junior and senior high school programs by selecting which strands/modules are most appropriate for:
    - meeting students' goals
    - expanding students' interests and capabilities
    - increasing students' confidence
    - placing students in learning environments that are best suited to students' learning styles and abilities
    - conferring with CTS teachers to provide information that will assist in instructional planning and assessment.

No one school will deliver all of the CTS strands/modules.

- Program Planning:
  - helping CTS teachers and administrators determine which strands and modules should be made available to students (short- and long-term)
  - assisting students, parents and community contacts to better understand the CTS curriculum goals and structure.

The teacher's role in helping students make effective career decisions is primarily in awareness and preparation. Teachers can help students relate what they are doing in the classroom with real-life experiences in a related career area or occupation. They can also help students build confidence that they can succeed in several career areas.

CHARTS

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Chart No. 1: CAREER AND TECHNOLOGY STUDIES STUDENT PLANNER

Name: ______________________________

Schools: ____________________ **Date:** ____________________

____________________ **Date:** ____________________

____________________ **Date:** ____________________

Interest / Emphasis	*	Grade 7	*	Grade 8	*	Grade 9	*	Grade 10	*	Grade 11	*	Grade 12	*

*C = Module Complete
I = Module Incomplete

☐ Number of modules completed successfully towards a
- trade designated occupation ______________________________
- post-secondary program ______________________________

Chart No. 2: BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements for each module. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework★. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages**. Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Managing Learning			
☐ comes to class prepared for learning	☐ ——→——→	☐ ——→——→	☐ ——→——→
☐ follows basic instructions, as directed	☐ follows instructions, with limited direction	☐ follows detailed instructions on an independent basis	☐ ——→——→
	☐ sets goals and establishes steps to achieve them, with direction	☐ sets clear goals and establishes steps to achieve them	☐ demonstrates self-direction in learning, goal setting and goal achievement
☐ acquires specialized knowledge, skills and attitudes	☐ applies specialized knowledge, skills and attitudes in practical situations	☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations	☐ transfers and applies learning in new situations; demonstrates commitment to lifelong learning
☐ identifies criteria for evaluating choices and making decisions	☐ identifies and applies a range of effective strategies for solving problems and making decisions	☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions	☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions
☐ uses a variety of learning strategies	☐ explores and uses a variety of learning strategies, with limited direction	☐ selects and uses effective learning strategies	☐ ——→——→
		☐ cooperates with others in the effective use of learning strategies	☐ provides leadership in the effective use of learning strategies
Managing Resources			
☐ adheres to established timelines; uses time/schedules/planners effectively	☐ creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis
☐ uses information (material and human resources), as directed	☐ accesses and uses a range of relevant information (material and human resources), with limited direction	☐ accesses a range of information (material and human resources), and recognizes when additional resources are required	☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement
☐ uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service	☐ uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision	☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis	☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies)
☐ maintains, stores and/or disposes of equipment and materials, as directed	☐ maintains, stores and/or disposes of equipment and materials, with limited assistance	☐ maintains, stores and/or disposes of equipment and materials on an independent basis	☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation			
☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches	☐ identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints	☐ thinks critically and acts logically in the context of problem solving	☐ identifies and resolves problems efficiently and effectively
☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ applies problem-solving skills to a directed or a self-directed activity, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ transfers problem-solving skills to real-life situations, by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks	☐ identifies and suggests new ideas to get the job done creatively, by: – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities in an active manner

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Communicating Effectively			
☐ uses communication skills; e.g., reading, writing, illustrating, speaking	☐ communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means	☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments	☐ negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests
☐ uses language in appropriate context	☐ uses technical language appropriately	☐ encourages, persuades, convinces or otherwise motivates individuals	☐ negotiates and works toward a consensus
☐ listens to understand and learn	☐ listens and responds to understand and learn	☐ listens and responds to understand, learn and teach	☐ listens and responds to understand, learn, teach and evaluate
☐ demonstrates positive interpersonal skills in selected contexts	☐ demonstrates positive interpersonal skills in many contexts	☐ demonstrates positive interpersonal skills in most contexts	☐ promotes positive interpersonal skills among others
Working with Others			
☐ fulfills responsibility in a group project	☐ →	☐ seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload	☐ leads, where appropriate, mobilizing the group for high performance
☐ works collaboratively in structured situations with peer members	☐ cooperates to achieve group results	☐ works in a team or group: – encourages and supports team members – helps others in a positive manner – provides leadership/ followership as required – negotiates and works toward consensus as required	☐ understands and works within the context of the group
☐ acknowledges the opinions and contributions of others in the group	☐ maintains a balance between speaking, listening and responding in group discussions		☐ prepares, validates and implements plans that reveal new possibilities
	☐ respects the feelings and views of others		
Demonstrating Responsibility			
Attendance			
☐ demonstrates responsibility in attendance, punctuality and task completion	☐ →	☐ →	☐ →
Safety			
☐ follows personal and environmental health and safety procedures	☐ recognizes and follows personal and environmental health and safety procedures	☐ establishes and follows personal and environmental health and safety procedures	☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations
☐ identifies immediate hazards and their impact on self, others and the environment	☐ identifies immediate and potential hazards and their impact on self, others and the environment	☐ →	☐ →
☐ follows appropriate/emergency response procedures	☐ →	☐ →	☐ →
			☐ demonstrates accountability for actions taken to address immediate and potential hazards
Ethics			
☐ makes personal judgements about whether or not certain behaviours/actions are right or wrong	☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school	☐ assesses the implications of personal/group actions within the broader community; e.g., workplace	☐ analyzes the implications of personal/group actions within the global context
			☐ states and defends a personal code of ethics as required

★Developmental Framework			
• *Simple task*	• *Task with limited variables*	• *Task with multiple variables*	• *Complex task*
• *Structured environment*	• *Less structured environment*	• *Flexible environment*	• *Open environment*
• *Directed learning*	• *Limited direction*	• *Self-directed learning, seeking assistance as required*	• *Self-directed/self-motivated*

*Chart No. 3: Opportunities for Making Connections Within CTS**

CTS Strands	Agriculture	Career Transitions	Communications Technology	Community Health	Construction Technology	Cosmetology Studies	Design Studies	Electro-Technologies	Energy and Mines	Enterprise and Innovation	Fabrication Studies	Fashion Studies	Financial Management	Foods	Forestry	Information Processing	Legal Studies	Logistics	Management and Marketing	Mechanics	Tourism Studies	Wildlife
Agriculture	■	■	▤	▤	■		■	▤	▤	▤	■		▤	▤	▤	▤	▤		■	■		▤
Career Transitions	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Communication Technology	▤	■	■					▤		▤		▤				▤	▤		▤			▤
Community Health	▤	■		■		▤	▤	▤	▤	▤		▤	▤	▤	■	▤	▤		▤			■
Construction Technologies	■	■			■			▤		▤			▤		▤	▤	▤		▤			
Cosmetology Studies		■		▤		■				▤		▤	▤			▤	▤		▤			
Design Studies	■	■		▤			■	▤		▤		■		▤		▤			▤	▤		
Electro-Technologies	▤	■	▤	▤	▤		▤	■	▤	▤	▤				▤	▤			▤	■		▤
Energy and Mines	▤	■		▤				▤	■	▤	■				▤	▤	▤		▤	■		▤
Enterprise and Innovation	▤	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤		■	▤	▤	▤
Fabrication Studies	■	■						▤	■	▤	■		▤		▤	▤	▤		▤			
Fashion Studies		■	▤	▤		▤	■			▤		■				▤			▤			
Financial Management	▤	■		▤	▤	▤				▤	▤		■	▤		▤	▤		▤	▤		▤
Foods	▤	■		▤			▤			▤			▤	■		▤			▤		▤	▤
Forestry	▤	■		■	▤			▤	▤	▤	▤				■	▤	▤		▤	▤	▤	■
Information Processing	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	■	▤		■	▤	▤	▤
Legal Studies	▤	■	▤	▤	▤	▤			▤	▤	▤		▤		▤	▤	■		▤		▤	▤
Logistics	▤	■							▤	▤					▤	▤			▤			
Management and Marketing	■	■	▤	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	■	▤		■	▤	▤	▤
Mechanics	■	■					▤	■	■	▤			▤		▤	▤			▤	■		
Tourism Studies		■								▤				▤	▤	▤	▤		▤		■	■
Wildlife	▤	■	▤	■				▤	▤	▤			▤	▤	■	▤	▤		▤		■	■

Provides many direct links with competencies in this strand. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts.	■
Provides some links with competencies developed in this strand, usually through the application of related technologies and/or processes.	▤

*See Appendix 4 of the CTS Manual for Administrators, Counsellors and teachers for more information.

*Chart No. 4: Opportunities for Making Connections Across the Curriculum**

CTS Strands	Junior High							Senior High											
	Language Arts	Social Studies	Mathematics	Science	Health & PLS	Physical Education	Fine Arts	English	Social Studies	Mathematics	Science (General)	Biology	Chemistry	Physics	CALM	Physical Education	Fine Arts	Social Sciences	Second Language
Agriculture	▤	▤	■	■				▤	▤	■	■	■	■		▤		▤		
Career Transitions	▤	▤	▤	▤	▤		▤	▤	▤	▤	▤				▤		▤	▤	
Communication Technology	▤	▤					▤	▤	▤		▤						▤		
Community Health	▤	▤			■	▤		▤	▤		▤	■	▤		■	▤			
Construction Technologies	▤	▤	■	■	▤			▤	▤	■	■	▤	▤	▤	▤				
Cosmetology Studies																			
Design Studies				▤			■				▤			▤			■		
Electro-Technologies	▤		■	■			▤	▤		■	■			■	▤				
Energy and Mines	▤	▤	▤	■				▤	▤		■		■	■	▤				
Enterprise and Innovation	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Fabrication Studies	▤	▤	■	■	▤			▤	▤	■	■		▤	▤	▤				
Fashion Studies			▤	▤					▤	▤							■	▤	
Financial Management	▤	▤	▤					▤		▤						▤			
Foods		▤	▤	▤	■				▤	▤	▤	▤	▤		▤	▤		▤	▤
Forestry	▤	▤	▤	■		▤		▤	▤	■	■	■			▤	▤			
Information Processing	■	▤	▤	▤	▤	▤	▤	■	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Legal Studies	▤	▤		▤				▤	▤		▤				▤				
Logistics		▤													▤			▤	▤
Management and Marketing	■	▤	▤	▤	▤			■	▤	▤	▤				▤		▤		
Mechanics	▤		■	▤				▤		▤	▤			▤					
Tourism Studies	▤	▤						▤	▤										▤
Wildlife	▤	▤	▤	■		■		▤	▤		■	■			▤	▤	▤	▤	

Provides many direct links with course content. Students will reinforce, extend and apply a substantial number of knowledge and/or skill components in practical contexts. ■

Provides some links with course content, usually through the application of related technologies and/or processes. ▤

*See Appendix 4 of the CTS Manual for Administrators, Counsellors and Teachers for more information.

Chart No. 5: IOP - CTS Connections

	Jr. High Occupational Themes			Senior High School IOP Occupational Course Sequence																			
CTS Strands	Business Education	Personal & Public Service	Technical/Occupational	Agriculture Production	Agricultural Mechanics	Horticultural Services	Business Services	Office Services	Building Services	Construction Services	Crafts and Arts	Technical Arts	Natural Resource Services	Child and Health Care	Esthetology	Fashion & Fabric Services	Hair Care	Commercial Food Preparation	Food Services	Maintenance & Hospitality Services	Automotive Services	Service Station Services	Warehouse Services
Agriculture			▨	▨		▨																	
Career Transitions	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨	▨
Communication Technology																							
Community Health		■												■									
Construction Technologies			▨		▨				■	▨													
Cosmetology Studies															▨		▨						
Design Studies																							
Electro-Technologies																					▨	▨	
Energy & Mines			▨										▨										
Enterprise & Innovation																							
Fabrication Studies			▨		■					▨													
Fashion Studies											▨					▨							
Financial Management																							
Foods																		▨	▨				
Forestry			▨										▨										
Information Processing	■																						
Legal Studies																							
Logistics																							▨
Management & Marketing	▨						■	■															
Mechanics			▨		■																■	■	
Tourism Studies																							
Wildlife																							

IOP occupational course that delivers many of the competencies defined in the CTS strand ■

IOP occupational course that delivers some of the competencies defined in the CTS strand ▨

In the following CTS scope and sequence charts, the asterisks placed with specific modules signifies that students who have completed the 16, 26, 36 occupational courses (having similar competencies to indicated CTS strands) may find successes in completing these modules.

Chart No. 6: Model of Off-Campus Programs

Each of the programs listed encourage partnerships between the school and its community and provide school/workplace learning opportunities. In these programs students can develop skills, knowledge and attitudes defined in the program of studies both on-campus and off-campus.

Program Parameters	PROGRAMS				
	Work Study (in all programs including CTS, core and other courses)	Work Experience 15–25–35		Integrated Occupational Program (IOP) (Occupational)	Registered Apprenticeship Program (RAP)
		Regular	Youth Internship ①		
Students affected	Grades 7–12	Grades 10–12	Grades 10–12	Grades 8–12	Grades 10–12
Credits available per course	1, 2, 3, 4, 5, 6 for each level of each CTS strand ② 3 or 5 for most other courses	3, 4, 5, 6, 7, 8, 9 or 10	8 or 10	Grade 10: 3 or 5 Grades 11–12: 10	5
Total credits available	Variable	30 ③	30 ③	40 ③	40
Time off-campus ④ (approx. %)	Variable	90% ⑤	90% ⑤	Variable	100% ⑥
Curriculum development	Alberta Education (for most courses). Some may be locally developed	Local development ⑤	Local development ⑤	Alberta Education	Business/industry through Advanced Education and Career Development (AE &CD)
Policy/guidelines/ restrictions ⑦			Subject to Federal funding guidelines		Governed by *Apprenticeship & Industry Training Act*
Payment to students	Not required	Not required	Not required	Not required	Required as per trade agreements
Sr. High students receive credits in:	Program Area: e.g., CTS strand, science, fine arts	Work Experience 15-25-35	Work Experience 15-25-35 or RAP	IOP 16–26–36 (Occupational)	RAP 15–25–35

① Youth Internship programs are funded by the federal government to approved school jurisdictions.
② Combinations of courses/credits are available for each level of each strand.
③ A maximum of 30 credits in Work Experience is available. A maximum of 15 of these credits can be counted toward the High School Diploma requirements.
④ Percentages refer to time spent off-campus in programs indicated, not to student's overall program.
⑤ School-based components are addressed through CTS Career Transitions modules.
⑥ Students must be in process of working toward an Alberta High School Diploma or a Certificate of Achievement.
⑦ All of these programs are subject to procedures specified in Alberta Education's Off-campus Education Policy.
* In development.

Chart No. 7 Summary of Credentialling Opportunities Linked to CTS

Credential	Agriculture	Career Transitions	Community Health	Construction Technologies	Energy and Mines	Foods	Forestry	Tourism	Wildlife
	Strand Name								
Alberta Conservation and Hunter Education Program									x
Alberta Fishing Education Program									x
Alberta Tourism Industry Standards: Freshwater Angling Guide							x		x
Alberta Tourism Industry Standards: Hunting Guide							x		x
Alberta Tourism Industry Standards: Outdoor Guide							x		x
Athletic First Aid			x						
Babysitting			x						
Canadian Firearms Safety Course		x							
CPR Level C		x	x						
Day Care Level 1			x						
Emergency Child Care			x						
Explosive Actuated Tools				x					
Family Health Care			x						
Farm Pesticide Certificate Program		x							
First-Aid Certification: Advanced First Aid Level II		x			x				
First-Aid Certification: Child Care			x						
First-Aid Certification: Emergency First Aid		x							
First-Aid Certification: Standard First Aid			x						
First-Aid: Basic Wilderness		x							
Flowers Canada Accreditation Program: Design Skills	x								
Flowers Canada Accreditation Program: Retail Skills	x								
Green Certificate Farm Training Program: Beef Production	x								
Green Certificate Farm Training Program: Crop Production	x								
Green Certificate Farm Training Program: Dairy Production	x								
Green Certificate Farm Training Program: Irrigated Crop Production	x								
Green Certificate Farm Training Program: Sheep Production	x								
Green Certificate Farm Training Program: Swine Production	x								
Job Safety Skills		x							
Lawn and Garden Domestic Pesticide Dispenser Course		x							
Oxygen Administration		x	x						
Pesticide Applicator Certificate, Agriculture		x							
Pesticide Applicator Certificate, Industrial		x							
Pesticide Applicator Certificate, Landscape		x							
Petroleum Industry Training Program: Blowout Prevention					x				
Petroleum Industry Training Program: Floorman Training					x				
Petroleum Industry Training Program: Hydrogen Sulphide Alive					x				
Petroleum Industry Training Program: Oilfield Maintenance					x				
Petroleum Industry Training Program: Petroleum Fundamentals					x				
Power Engineering Technology		x							
Retail Pesticide Dispenser Certificate (Class I)		x							
Safe Food Handler						x			
Tourism: Alberta Best								x	
Transportation of Dangerous Goods (TDG)		x							
Workplace Hazardous Materials Information System (WHMIS)		x							

Chart No. 8: Career and Technology Studies: Potential Linkages with Alberta's Apprenticeship Trades

		CTS Strands												Enhancement Modules		
	Trade	Agriculture	Communication Technology	Construction Technologies	Cosmetology	Design Studies	Electro-Technologies	Energy & Mines	Fabrication Studies	Fashion Studies	Foods	Management & Marketing	Mechanics	Career Transitions	Enterprise & Innovation	Work Experience
High Degree of Alignment With Apprenticeable Trades	Agricultural Mechanic	▤					▤		▤				■	▤	▤	▤
	Autobody Mechanic								▤				■	▤	▤	▤
	Baker										■			▤	▤	▤
	Cabinetmaker			■										▤	▤	▤
	Carpenter			■		▤								▤	▤	▤
	Communication Electrician		▤				■							▤	▤	▤
	Cook										■			▤	▤	▤
	Electrician			▤			■							▤	▤	▤
	Electronic Technician						■							▤	▤	▤
	Hairstylist				■									▤	▤	▤
	Heavy Duty Mechanic						▤		▤				■	▤	▤	▤
	Landscape Gardener	■		▤		▤						▤	▤	▤	▤	▤
	Machinist					▤			■				▤	▤	▤	▤
	Motorcycle Mechanic						▤		▤				■	▤	▤	▤
	Motor Mechanic						▤		▤				■	▤	▤	▤
	Printing & Graphic Arts Craftsman		■			■	▤			▤				▤	▤	▤
	Sheet Metal Worker					▤			■					▤	▤	▤
	Tool & Die Maker					▤			■					▤	▤	▤
	Welder						▤		■				▤	▤	▤	▤
Partial Alignment With Apprenticeship Trades	Appliance Serviceman						▤						▤	▤	▤	▤
	Boilermaker							▤	▤					▤	▤	▤
	Bricklayer			▤										▤	▤	▤
	Cement Finisher			▤										▤	▤	▤
	Crane & Hoisting Equipment Operator			▤				▤						▤	▤	▤
	Electrical Rewind Mechanic						▤							▤	▤	▤
	Elevator Constructor								▤					▤	▤	▤
	Floorcovering Installer			▤										▤	▤	▤
	Gasfitter								▤					▤	▤	▤
	Glassworker					▤								▤	▤	▤
	Instrument Mechanic						▤							▤	▤	▤
	Insulator			▤										▤	▤	▤
	Ironworker								▤					▤	▤	▤
	Lather-Interior System Mechanic			▤										▤	▤	▤
	Millwright						▤		▤				▤	▤	▤	▤
	Painter & Decorator			▤		▤				▤				▤	▤	▤
	Partsman						▤						▤	▤	▤	▤
	Plasterer			▤										▤	▤	▤
	Plumber			▤										▤	▤	▤
	Power Lineman						▤							▤	▤	▤
	Power System Electrician						▤							▤	▤	▤
	Projectionist		▤				▤							▤	▤	▤
	Recreation Vehicle Mechanic			▤			▤		▤				▤	▤	▤	▤
	Refrigeration & Air Conditioning Mechanic			▤			▤						▤	▤	▤	▤
	Roofer			▤										▤	▤	▤
	Sawfiler			▤										▤	▤	▤
	Circular Sawfiler			▤										▤	▤	▤
	Sprinkler Systems Installer								▤					▤	▤	▤
	Steamfitter-Pipefitter							▤	▤					▤	▤	▤
	Structural Steel and Plate Fitter								▤					▤	▤	▤
	Tilesetter			▤										▤	▤	▤
	Transport Refrigeration Mechanic												▤	▤	▤	▤
	Water Well Driller							▤						▤	▤	▤

CTS Strands - that deliver many of the competencies / program defined in the first period of the apprenticeship program ■

CTS Strands - that deliver some of the competencies / program defined in the first period of the apprenticeship program ▤

Chart No. 9: Sample Of Potential Post Secondary Transitions from CTS

FOODS: Summary of Related Post-secondary Programs *

DRAFT

	PUBLIC COLLEGES												PRIVATE COLLEGES						TECH. INST.			UNIVERSITIES				VOCATIONAL COLLEGES			
	Alberta College of Art & Design	Fairview College	Grande Prairie Regional College	Grant MacEwan Community College	Keyano College	Lakeland College	Lethbridge Community College	Medicine Hat College	Mount Royal College	Olds College	Red Deer College	**APPRENTICESHIP TRADE**	Alberta College	Augustana University College	Canadian Union College	Concordia College	King's University College, The	North American Baptist College	Northern Alberta Institute of Technology	Southern Alberta Institute of Technology	Banff Centre	Athabasca University	University of Alberta	University of Calgary	University of Lethbridge	AVC - Calgary	AVC - Edmonton	AVC - Lac La Biche	AVC - Lesser Slave Lake
Administration (including Hotel/Restaurant)			CD	CD			CD		CD										VC	CD	V	CB(3y) B(4y)	VCDM	C	CBM				
Dietary Technology/Dietetics								1t							2t				C	VD									
Food Science (degree program)			1t					1t	1t		2t			1t	2t	1t							BMPhD		1t				
Home Economics (including a degree program in Foods & Nutrition			1t					1t	1t		2t				V								BM						
Baker/Baking												3y							VC	C									
Cook/Cooking		C			C	C	CD					3y							VCD	D								C1t	C(14 w)
Meat Cutting and Merchandising/Processing							CD			C									C	C									
Restaurant Service							V				CD									C(8 w)									

CODES:	B	Bachelor's Degree	D	Diploma (2 years)	w	weeks
	M	Master's Degree	V	Varies	m	months
	Ph.D.	Doctoral Degree	1t	One-year transfer	y	years
	C	Certificate (1 year or less)	2t	Two-year transfer		

***Information adapted from "It's About Time: To Start Thinking About Your Future", Advanced Education and Career Development, 1995.**

Chart(s) No. 10:

National Occupational Classification Correlations to CTS Strands

August 1997

The following charts correlate selected CTS strands to occupations listed in the National Occupational Classification (NOC). The classification provides a systematic taxonomy of occupations in the Canadian labour market.

The NOC system is based on skill level and skill type criteria. The chart below shows the level of education, training and other criteri used to describe the four skill levels A - D.

NOC SKILL LEVEL CRITERIA

	EDUCATION/TRAINING	OTHER
SKILL LEVEL A	• University degree (bachelor's, master's, or post-graduate	
SKILL LEVEL B	• Two to three years of post-secondary education at community college , institute of technology or CEGEP or • Two to four years of apprenticeship training or • Three to four years of secondary school and more than two years of on-the-job training courses or specific work experience.	• Occupations with supervisory responsibilities are assigned to skill level B. • Occupations with significant health and safety responsibilities (e.g., fire fighters, police officers and registered nursing assistants) are assigned to skill level B.
SKILL LEVEL C	• One to four years of secondary school education • Up to two years of on-the-job training courses or specific work experience	
SKILL LEVEL D	• Up to two years of secondary school and short work demonstration or on-the-job training	

Source: National Occupational Classification: Occupational Descriptions. Employment and Immigration Canada, Minister of Supply and Service Canada, 1993.

The Skill Type defines the type of work performed and is represented in NOC by the first number in each of the occupational area's classification.

0=Management Occupations
1=Business, Finance and Administration
2=National and Applied Sciences and Related Occupations
3=Health Occupations
4=Occupations in Social Sciences, Education, Government Service and Religion
5=Occupations in Art, Culture, Recreation and Sport
6=Sales and Service
7=Trades, Transport and Equipment Operators and Related Occupations
8=Occupations Unique to Primary Industry
9=Occupations Unique to Processing, Manufacturing and Utilities.

AGRICULTURE

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Agricultural and Fish Products Inspectors	2222	✓		✓	✓
Agricultural and Related Service Contractors and Managers	8252	✓		✓	✓
Agricultural Commodity Inspectors	2222	✓		✓	✓
Agricultural Engineer	2148				✓
Agricultural Engineering Technologist	2221/2223			✓	✓
Agricultural Mechanic/Farm Equipment Mechanic	7312		✓		
Agricultural Products Processing Occupations	9461	✓			
Agricultural Representatives, Consultants and Specialist	2123				✓
Animal Care Attendant	6483			✓	✓
Animal Health Technologist	3213			✓	
Artificial Insemination Technologist	8252			✓	
Aquaculture and Marine Harvest Labourers	8611	✓			
Aquaculture Operators and Managers	8257	✓		✓	
Beekeeper	8251	✓		✓	
Biochemist	2112				✓
Biological Technician	2221			✓	✓
Biologist and Related Scientists	2121				✓
Botanist	2121				✓
Dairy Producer	8251			✓	
District Agriculturist	2123			✓	✓
Environmental Auditor	2263			✓	✓
Environmental Education Specialist	4169				✓
Environmental Engineer	2131/2148				✓
Farm Supervisors and Specialized Livestock Workers	8253	✓		✓	
Farm Workers	8431	✓			
Farmers and Farm Managers	8251	✓		✓	
Farrier	7383			✓	
Feed Mill Worker (Production)	9461	✓			
Florist (Floral Designer)	6421			✓	
Grain and Forage Crop Producers	8251	✓		✓	✓
Grain Elevator Manager	6234	✓		✓	
Grain Elevator Operators	6234	✓			
Greenhouse/Nursery Operator	8254/8256	✓		✓	
Harvesting Labourers	8611	✓			
Hazardous Waste Management Technician	2263			✓	
Hydrologist	2113				✓
Inspectors in Public and Environmental Health and Occupational Health & Safety	2263	✓		✓	✓
Land Surveyors	2154				✓

Agriculture Continued

AGRICULTURE continued

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Landscape and Horticulture Technicians and Specialists	2225			✓	✓
Landscape Architect	2152				✓
Landscape Architectural Technologist	2225			✓	
Landscape Gardener	2225		✓		
Landscaping and Grounds Maintenance Contractors and Manager	8255			✓	
Landscaping and Grounds Maintenance Labourers	8612	✓			
Livestock Producer	8251	✓	✓	✓	✓
Manufacturing Managers	0911			✓	✓
Market Gardener	8251	✓		✓	
Other Labourers in Processing, Manufacturing and Utilities	9619	✓			
Other Professional Engineers	2148				✓
Other Professional Occupations in Physical Sciences	2115				✓
Pet Groomer and Animal Care Worker	6483		✓		
Pest Control Operator/Exterminator	7444		✓		
Pollution Control Technical	2211				✓
Primary Production Managers	0811				✓
Supervisors, Food, Beverage	6212	✓			
Supervisors, Landscape and Horticulture	8256	✓			
Testers and Graders, Food and Beverage Processing	9465	✓			
Turfgrass Management Specialist	2225			✓	
Veterinarian	3114				✓

COMMUNICATION TECHNOLOGY

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Advertising Copywriter	5121			✓	✓
Binding and Finishing Machine Operators	9473		✓	✓	
Broadcast Maintenance Technologist	5224			✓	
Camera, Platemaking and Other Pre-Press Occupations	9472	✓	✓	✓	
Cartoonist	5241			✓	✓
Casting Director	5226	✓		✓	✓
Cinematographer	5222			✓	✓
Film and Video Camera Operators	5222			✓	
Film Animator	5241			✓	✓
Graphic Arts Technicians	5223			✓	✓
Graphic Designers and Illustrating Artists	5241			✓	✓
Journalists	5123			✓	✓
Managers in Publishing, Motion Pictures, Broadcasting and Performing Arts	0512			✓	✓
Photographers	5221			✓	✓
Photographic and Film Processors	9474			✓	
Printing and Graphic Arts Craftsmen	9472		✓		
Printing Machine Operators	9471	✓		✓	
Printing Press Operators	7381		✓	✓	
Producers, Directors, Choreographers and Related Occupations	5131			✓	✓
Professional Occupations in Public Relations and Communications	5124			✓	✓
Projectionist	5227	✓			
Reporter (Print and Broadcast Media)	5123			✓	✓
Supervisors, Printing and Related Occupations	7218	✓		✓	
Television Equipment Operators	5222			✓	
Traffic Clerk/Assistant	1473	✓			
Writers	5121			✓	✓

COMMUNITY HEALTH

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Ambulance Attendants and Other Paramedical Occupations	3234			✓	
Applied Chemical Technologist	2211		✓	✓	
Audiologists and Speech-Language Pathologists	3141				✓
Babysitters, Nannies and Parent Helpers	6474	✓			
Biologists and Related Scientists	2121				✓
Cardiology Technician	3217			✓	
Child and Youth Care Workers	4212			✓	✓
Chiropractor	3122				✓
Community and Social Service Workers	4152			✓	✓
Dental Assistant	3411			✓	
Dental Hygienist and Dental Therapist	3222			✓	
Dental Laboratory Bench Worker	3412	✓			
Dental Technician	3223			✓	
Dentist	3113				✓
Denturist	3221			✓	
Dieticians and Nutritionists	3132				✓
Domestic Service Personnel	6471	✓			
Dry Cleaning and Laundry Occupations	6681	✓			
Dry Cleaning and Laundry Supervisors	6214	✓			
Electroencephalographic and Other Diagnostic Technologists	3218			✓	
Elemental Medical and Hospital Assistants	3413	✓			
Employment Counsellor	4213			✓	✓
Family, Guidance, Marriage and Other Related Counsellors	4153				✓
Family, Marriage and Other Related Counsellors	4153				✓
General Practitioners and Family Physicians	3112				✓
Head Nurse and Supervisors	3151				✓
Health Policy Researchers, Consultants and Program Officers	4165				✓
Home Economist	4164				✓
Inspectors in Public and Environmental Health in Occupational Health and Safety	2263			✓	✓
Janitors, Caretakers and Building Superintendents	6663	✓			
Janitors, Caretakers and Building Supervisors	6215	✓			

Community Health continued

COMMUNITY HEALTH continued

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Light Duty Cleaners	6661	✓			
Manager in Health Care	0311				✓
Medical Laboratory Technician	3212			✓	
Medical Laboratory Technologists and Pathologists' Assistants	3211				✓
Medical Radiation Technologist	3215			✓	
Medical Secretaries	1241			✓	
Medical Sonographer	3216			✓	
Medical Transcriptionist	1244			✓	
Midwives and Practitioners of Natural Healing	3232			✓	✓
Minister of Religion	4154			✓	✓
Nurses Aides and Orderlies	3233			✓	
Occupational Therapist	3143				✓
Optician	3231		✓		
Optometrist	3121				✓
Other Aides and Assistants in Support of Health Services	3414	✓			
Other Medical Technologists and Technicians (except Dental Health)	3219			✓	
Other Professional Engineer	2148				✓
Other Professional Occupations in Health Diagnosing and Treating	3219				✓
Other Professional Occupations in Social Science	4169				✓
Other Technical Occupations in Therapy and Assessment	3235			✓	
Pharmacist	3131				✓
Physiotherapist	3142				✓
Psychology	4151				✓
Receptionists and Switchboard Operators	1414	✓			
Registered Nurse	3152				✓
Registered Nursing Assistant	3233			✓	
Respiratory Therapists and Clinical Perfusionists	3214			✓	✓
Social Worker	4152				✓
Specialist Physician	3111				✓
Visiting Homemakers, Housekeepers and Related Occupations	6471	✓			

CONSTRUCTION TECHNOLOGIES

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Bricklayer	7281		✓		
Cabinetmakers	7272		✓		
Carpenters	7271		✓		
Cement Finishers	7282		✓		
Concrete, Clay and Stone Forming Operators	9419	✓			
Construction Estimators	2234	✓		✓	
Construction Inspectors	2264	✓		✓	
Construction Managers	0711	✓		✓	✓
Construction Trade Helpers and Labourers	7611	✓			
Contractors and Supervisors, Carpentry Trades	7215		✓		
Contractors and Supervisors, Heavy Construction Equipment Crews	7217		✓		
Contractors and Supervisors, Other Construction Trades, Installers, Repairers and Services	7219		✓		
Contractors and Supervisors, Pipefitting Trades	7213		✓		
Crane and Hoisting Equipment Operators	7371		✓		
Elevator Constructor	7318		✓		
Floorcovering Installer	7295		✓		
Gasfitters	7253		✓		
Glaziers/Glassworkers	7292		✓		
Heavy Equipment Operators	7421	✓			
Insulators	7293				
Lather/Interior Systems Mechanics	7284		✓		
Machinist/Machining Tool Operators	9511		✓		
Nondestructive Testers and Inspectors	2261			✓	
Other Trades and Related Occupations	7383	✓		✓	
Other Wood Products Assemblers and Inspectors	9493	✓			
Painters and Decorators	7294		✓		
Plasterers, Drywall Installers and Finishers and Lathers	7284		✓		
Plating, Metal Spraying and Related Operators	9497	✓			
Plumbers	7251		✓		
Residential Home Builders and Renovators	0712				
Roofers	7291		✓		
Steamfitters, Pipefitters and Sprinkler System Installers	7252		✓		
Tilesetters	7283		✓		
Woodworking Machine Operators	9224		✓		

COSMETOLOGY

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupational Profile	**NOC#**	**D**	**C**	**B**	**A**
Estheticians, Electrologists and Related Occupations	6482	✓		✓	
Hairstylists and Barbers	6271		✓		
Makeup Artist	5226	✓			
Other Services Managers	6216				✓

DESIGN STUDIES

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Aerospace Engineer	2146				✓
Architect	2151				✓
Architectural Technologists and Technicians	2251			✓	
Ceramic Engineer	2142				✓
Chemical Engineer	2134				✓
Chemical Engineering Technologist	2211			✓	
Civil Engineer	2131				✓
Civil Engineering Technologists and Technicians	2231			✓	
Drafting Technologists and Technicians	2253			✓	
Engineering Design and Drafting Technologists	2253			✓	
Exhibit Designer	5252	✓		✓	
Industrial Designer	2252			✓	✓
Industrial and Manufacturing Engineers	2141				✓
Industrial Engineering Technologist	2233			✓	
Interior Designer	5242			✓	✓
Jeweler	7344	✓		✓	
Landscape Architect	2152				✓
Landscape Architectural Technologist	2225			✓	
Mechanical Engineer	2132				✓
Mechanical Engineering Technologist	2232			✓	
Metallurgical (Materials) Engineer	2142				✓
Other Professional Engineers	2148				✓
Robotics Technologist	2241			✓	
Theatre Designer	5243			✓	✓
Upholsterer	7341	✓		✓	
Urban and Land Use Planners	2153				✓

ELECTRO-TECHNOLOGIES

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupation Profile	NOC#	D	C	B	A
Audio and Video Recording Technicians	5225	✓		✓	
Avionics Technician	2244			✓	✓
Broadcast Technician	5224			✓	
Cable Television Service and Maintenance Technicians	7247	✓		✓	
Communication Electrician	7246			✓	
Contractors and Supervisors, Electrical Trades and Telecommunication Occupations	7212		✓		
Electric Appliance Servicers and Repairers	7332		✓		
Electrical and Electronic Engineers	2133				✓
Electrical Engineering Technologist	2241			✓	
Electrician	7241		✓		
Electrical Mechanic	7333		✓		
Electrical Power Line and Cable Workers	7352		✓		
Electrical Rewind Mechanic	7333 2242		✓		
Electronic Technician	2241		✓		
Electronics Engineering Technologist	2241			✓	
Electronic Service Technicians (Household and Business Equipment)	2242		✓	✓	
Fiber Optics Technician	2241			✓	
Industrial Electricians	7242			✓	
Laser Technician	2241			✓	
Meter Reader	1454	✓			
Power Lineman	7244		✓		
Power System Electrician	7243		✓		
Power Systems and Power Station Operators	7352		✓	✓	
Stationary Engineers and Auxiliary Equipment Operators	7351		✓	✓	
Supervisors, Electrical Products Manufacturing	9223	✓			
Supervisors, Electronics Manufacturing	9222	✓		✓	
Telecommunications Installation and Repair Workers	7246	✓		✓	
Telecommunications Line and Cable Workers	7245		✓	✓	
Utilities Managers	9227			✓	✓

ENERGY & MINES

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupational Profile	**NOC#**	**D**	**C**	**B**	**A**
Bitumen Extraction Plant Operators	9232	✓			
Bitumen Upgrading Plant Operators	?	✓			
Boilermakers	7262		✓		
Central Control and Process Operators, Mineral and Metal Processing	9231	✓			
Commercial Divers	7382	✓			
Drillers and Blasters - Surface Mining, Quarrying and Construction	7372	✓			
Drilling Rig Crews and Service Rig Crews	8232	✓			
Environmental Auditors	2263				✓
Environmental Education Specialists	4169				✓
Environmental Engineers	2148/2263				✓
Field Production Operators	8232			✓	
Foundry Workers	9412	✓			
Gas Pipeline Operators	9232	✓			
Gas Plant Operators	9232			✓	
Geologists, Geochemists and Geophysicists	2113				✓
Geological Engineers	2144				✓
Geological and Mineral Technologists and Technicians	2212			✓	
Hazardous Waste Management Technicians	2263			✓	
Inspectors and Testers, Mineral and Metal Processing	9415	✓			
Inspectors, Public and Environmental Health and Occupational Health and Safety	2263				✓
Labourers in Chemical Products Processing and Utilities	9613	✓			
Labourers in Mineral and Metal Processing	9611	✓			
Land Agents	1221			✓	
Machine Operators, Mineral and Metal Processing	9411	✓			
Mechanical Engineers	2132				✓
Manufacturing Managers	2141			✓	✓
Metallurgical and Materials Engineers	2142				✓
Mine Labourers	8614	✓			
Mining Engineers	2143				✓
Mineral Engineering Technologists	2212			✓	
Mining Equipment Operators	8231	✓			
Nondestructive Testers and Inspectors	2261	✓		✓	✓
Nuclear Engineering Technicians	2232			✓	
Nuclear Engineers	2132				✓

Energy & Mines continued

ENERGY & MINES continued

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupational Profile	NOC#	D	C	B	A
Oil and Gas Well Drillers, Servicers, Testers and Related Workers	8412	✓			
Oil and Gas Drilling, Servicing and Related Labourers	8615	✓			
Oil and Gas Well Drilling Workers and Services Operators	8412	✓			
Oil Pipeline Operators	8232	✓			
Oil Sands Mining Occupations	8411?	✓			
Petrochemical Engineering Technologists	2211			✓	
Petroleum Engineers	2145				✓
Petroleum Engineering Technologists	2212			✓	
Petroleum, Gas and Chemical Process Operators	9232	✓			
Pollution Control Technicians	2231			✓	
Primary Production Managers (except Agriculture)	0811				✓
Refinery/Upgrader Process Operators	9231			✓	
Seismic Crews	8615	✓		✓	
Specialized Oil Field Service Occupations	8232	✓			
Supervisors, Mineral and Metal Processing	9211	✓			
Supervisors, Mining and Quarrying	8221	✓		✓	✓
Supervisors, Oil and Gas Drilling and Service	8222	✓		✓	
Supervisors, Petroleum, Gas and Chemical Processing and Utilities	9212	✓			
Surveying Engineers	2131				✓
Surveying Technologists	2254			✓	
Underground Mine Service and Support Workers	8231	✓			
Underground Production and Development Miners	8231	✓			
Utilities Managers	091				✓
Water and Waste Plan Operators	9424	✓		✓	
Water Well Drillers	7374	✓			
Waterworks and Gas Maintenance Workers	7442	✓			
Well Service Pump Equipment Operator Crews	8412	✓			
Wireline Workers	8232	✓		✓	✓

FABRICATION STUDIES

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupational Profile	NOC#	D	C	B	A
Blacksmiths and Die Setters	7266	✓			
Boiler Maker	7262	✓			
Contractors and Supervisors, Metal forming, Shaping and Erecting Occupations	7211	✓			
Forging Machine Operators	9512	✓			
Industrial Engineering and Manufacturing Technologists and Technicians	2233			✓	✓
Ironworkers	7264		✓		
Labourers in Metal Fabrication	9612	✓			
Labourers in Rubber and Plastic Products Manufacturing	9615	✓			
Materials Engineering Technologists	2231/2233			✓	✓
Metalworking Machine Operators	9514	✓			
Other Metal Products Machine Operators	9516	✓			
Other Trades Helpers and Labourers	7612	✓			
Plastics Processing Machine Operators	9422	✓			
Plastic Products Assemblers, Finishers and Inspectors	9214	✓			
Rubber processing Machine Operators and Related Workers	9423	✓			
Sheet Metal Workers	7261		✓		
Sprinkler Systems Installer	7252		✓		
Steamfitter–Pipefitter	7252		✓		
Structural Metal and Platework Fabricators and Fitters	7263		✓		
Supervisors, Plastic and Rubber Products Manufacturing	9214	✓			
Tool and Die Maker	7232		✓		
Welder	7265		✓		
Welding, Brazing and Soldering Machine Operators	9515	✓			

FASHION STUDIES

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupational Profile	NOC#	D	C	B	A
Display Designer/Visual Merchandiser	5243	✓		✓	
Dry Cleaning and Laundry Occupations	6681	✓			
Dry Cleaning and Laundry Supervisors	6214	✓			
Fabric, Fun and Leather Cutters	9452	✓			
Fashion Designer	5243	✓		✓	✓
Hide and Pelt Processing Workers	9453	✓			
Image, Social and Other Personal Consultants	6481	✓		✓	
Industrial Engineering and Manufacturing Technologists and Technicians	2233			✓	
Inspectors and Testers, Fabric, Fur and Leather Products Manufacturing	9454	✓			
Ironing, Pressing and Finishing Occupations	9619	✓			
Jewellers, Watch Repairers and Related Occupations	7344	✓		✓	
Labourers in Textile Processing	9616	✓			
Manufacturing Managers	0911	✓		✓	✓
Model	5232	✓			
Other Labourers in Processing, Manufacturing and Utilities	961	✓			
Other Professional Engineers	2148				✓
Patternmakers – Textile, Leather and Fur Products	5245	✓		✓	
Retail and Wholesale Buyers	6233	✓		✓	✓
Retail Salespersons and Sales Clerks	6421	✓			
Retail Trade Managers	6211	✓		✓	✓
Sewing Machine Operators	9451	✓			
Shoe Repairers and Leatherworkers	9498	✓		✓	
Supervisors, Fabric, Fur and Leather Products Manufacturing	9225	✓			
Supervisor, Textile Processing	9216	✓		✓	
Tailors, Dressmakers, Furriers and Milliners	7342	✓			
Textile Dyeing and Finishing Machine Operators	9443	✓			
Textile Fibre and Yarn Preparation Machine Operators	9441	✓			
Textile Inspectors, Graders and Samplers	9444	✓			
Theatre, Fashion, Exhibit and Other Creative Designers	5243			✓	✓
Weavers, Knitters and Other Fabric Making Occupations	9442	✓			

FINANCIAL MANAGEMENT

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Accounting and Related Clerks	1431	✓		✓	
Actuary	2161				✓
Assessors, Valuators and Appraisers	1235			✓	
Banking, Credit and Other Investment Managers	0122			✓	✓
Banking, Insurance and Other Financial Clerks	0121	✓			
Bookkeepers	1231			✓	
Cashiers	6611	✓			
Collectors	1435	✓			
Credit Loans Manager	1212			✓	
Customs, Ship and Other Brokers	1236	✓		✓	
Economic Development Officers and Marketing Researchers and Consultants	4163				✓
Economists and Economic Policy Researchers and Analysts	4162				✓
Financial Auditors and Accountants	1111			✓	✓
Financial and Investment Analysts	1112				✓
Financial Managers	0111				✓
Financial Planner	1114	✓			
Insurance Adjusters and Claims Examiners	1233	✓		✓	✓
Insurance Agents and Brokers	6231	✓			
Insurance, Real Estate and Financial Brokerage Managers	0121			✓	✓
Insurance Underwriters	1234	✓		✓	✓
Investment Advisor/Stockbroker	1113	✓			
Investment Underwriter	1114				✓
Loan Officer	1232	✓		✓	✓
Other Business Services Managers	1122				✓
Other Financial Officers	1114			✓	✓
Payroll Clerks	1432			✓	
Production Clerks	1473	✓			
Property Administrators	1224			✓	
Purchasing Agents and Officers	1225			✓	✓
Purchasing and Inventory Clerks	1474	✓			
Purchasing Managers	0113			✓	✓
Real Estate Agents and Salespersons	6232	✓			
Securities Agents, Investment Dealers and Traders	1113			✓	✓
Supervisors, Finance and Insurance Clerks	1212			✓	
Tellers	1433	✓			

FOODS

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupational Profile	NOC#	D	C	B	A
Applied Chemical Technologists and Technicians	2211			✓	
Baker	6252		✓		
Banqueting/Catering Supervisors	0631			✓	✓
Biological Technicians and Technologists	2221			✓	
Butchers and Meat Cutters, Retail and Wholesale	9462	✓			
Chef	6241		✓		
Cook	3133		✓		
Dietitians and Nutritionists	9463				✓
Fish Plant Worker	6453	✓			
Food and Beverage Servers	6641	✓			
Food Service Counter Attendants and Food Preparers	6241	✓			
Food Service Supervisors	6212	✓			
Grocery Clerks and Shelf Stockers	6622	✓			
Industrial Butchers and Meat Cutters, Poultry Preparers and Related workers	9462	✓			
Kitchen and Food Service Helpers	6642	✓			
Labourers in Fish Processing	9618	✓			
Labourers in Food, Beverage and Tobacco Processing	9617	✓			
Maitres d'hotel and Hosts/Hostesses	6451	✓			
Manufacturing Manager	0911			✓	
Process Control and Machine Operators, Food and Beverage Processing	9461	✓			
Purchasing Manager	0113				✓
Restaurant and Food Service Managers	0631			✓	
Retail and Wholesale Buyers	6233			✓	✓
Supervisors, Food, Beverage and Tobacco Processing	6212	✓			
Testers and Graders, Foods and Beverage Processing	9465	✓			

FORESTRY

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	**NOC#**	**D**	**C**	**B**	**A**
Arborist	2225			✓	✓
Biochemist	2112				✓
Biologist and Related Scientist	2121				✓
Botanist	2121				✓
Chemist	2112				✓
Chainsaw and Skidder Operators	8421	✓			
Environmental Auditor	2263				✓
Environmental Education Specialist	4161				✓
Environmental Engineer	2131				✓
Forest Technologist	2223			✓	
Forester/Forestry Scientist	2122				✓
Forestry Professionals	2122				✓
Forestry Worker	8422			✓	
Hazardous Waste Management Technician	2263			✓	
Hydrologist	2113				✓
Inspectors in Public and Environmental Health and Occupational Health and Safety	2263			✓	✓
Interpretive Naturalist	2121			✓	✓
Labourers in Wood, Pulp and Paper Processing	9614	✓			
Land Surveyor	2154				✓
Land Use/Community Planner (Urban, Regional, Park)	2153				✓
Logging and Forestry Labourers	8616	✓			
Logging Machinery Operators	8241	✓			
Lumber Graders and Other Wood Processing Inspectors and Graders	9436	✓			
Other Wood Processing Machine Operators	9434	✓			
Paper Converting Machine Operators	9435	✓			
Papermaking and Coating Control Operators	9234	✓			
Papermaking and Finishing Machine Operators	9433	✓			
Pollution Control Technician	2231			✓	
Pulp Mill Machine Operators	9432	✓		✓	
Pulping Control Operators	9233	✓		✓	
Primary Production Managers (except Agriculture)	0911				✓
Sawmill Machine Operators	9431	✓			
Silviculture and Forestry Workers	8422	✓		✓	
Supervisors, Forest Products Processing	9215	✓		✓	
Supervisor, Logging and Forestry	8211	✓		✓	
Utilities Managers	0912			✓	✓

INFORMATION PROCESSING

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupation Profile	NOC#	D	C	B	A
Administrative Officers	1221	✓		✓	✓
Computer Engineers	2147				✓
Computer Operators	1421	✓		✓	
Computer Programmers	2163			✓	✓
Computer Service Technologist	2242			✓	✓
Computer Systems Analyst	2162			✓	✓
Correspondence, Publication and Related Clerks	1452	✓			
Data Entry Clerks	1422	✓		✓	
Demographer	2161				✓
Desktop Publishing Specialist	1423			✓	✓
Economist	4162				✓
Executive Assistant	1222	✓		✓	
File Clerk	1413	✓			
General Office Clerks	1411	✓		✓	
Health Record Administrator	0114			✓	
Health Record Technician	1413			✓	
Information Systems Consultant	2162				✓
Librarian	5111			✓	✓
Library Clerk	1451	✓			
Library Technician	5211			✓	
Medical Transcriptionist	1244			✓	
Office Machine Technician	2242			✓	
Receptionist	1414	✓			
Secretaries (except Legal and Medical)	1241	✓		✓	
Survey Interviewers and Statistical Clerks	1454	✓			
Typesetter and Related Occupations	1423			✓	
Typist and Word Processor Operators	1412	✓		✓	

LEGAL STUDIES

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Administrative Clerk	1441			✓	
Bylaw Enforcement Officer	6463			✓	
Correctional Officer	6462	✓			
Correctional Services Officers	6462			✓	✓
Correctional Services Worker	4155			✓	
Court Clerks	1443	✓			
Court Officer/Justice of the Peace	1227			✓	✓
Court Reporter	1244			✓	
Customs Inspector	1228			✓	
Immigration Officer	1228			✓	✓
Judge	4111				✓
Judicial Clerk	1443	✓		✓	
Land Titles Examiner	4211	✓			
Lawyer	4112				✓
Legal Assistant	4211			✓	
Legal Secretary	1242	✓		✓	
Managers in Social, Community and Correctional Services	0411				✓
Other Business Services Managers	1122				✓
Other Protective Service Occupations	6651				✓
Paralegal and Related Occupations	4211	✓		✓	✓
Parole Officer	4155				✓
Police Officer	6261	✓		✓	✓
Private Investigator	6465				
Security Guards	6651	✓		✓	
Sheriffs and Bailiffs	6461	✓	✓		

LOGISTICS

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Aerospace Engineer	2146				✓
Aircraft Assemblers and Assembly Inspectors	9226			✓	
Aircraft Instrument, Electrical and Avionics Mechanics, Technicians and Inspectors	2244		✓	✓	
Aircraft Mechanic and Aircraft Inspectors	7315			✓	
Airline Sales and Service Agents	6433	✓			
Airline Pilots, Flight Engineers and Flying Instructors	2271	✓		✓	✓
Air Traffic Control Occupations	2272	✓			
Air Transport Ramp Attendant	7437	✓			
Boat Assemblers and Inspectors	9491	✓			
Bus Drivers, Subway Operators and Other Transit Operators	7412	✓			
Couriers and Messengers	1463	✓			
Deck Officers, Water Transport	2273	✓			
Delivery Driver	7414	✓			
Engine Room Crew, Water Transport	7434	✓			
Engineering Inspectors and Regulatory Officers	2262			✓	✓
Engineering Officers, Water Transport	2274	✓			
Facility Operations Manager	0721			✓	✓
Letter Carrier	1462	✓			
Lock and Cable Ferry Operators and Related Occupations	7435	✓			
Longshore Worker	7451	✓			
Mail, Postal and Related Clerks	1461	✓			
Materials Handler	7452	✓			
Other Service Manager	0621			✓	
Postal and Courier Services Managers	0132			✓	✓
Pursers and Flight Attendants	6432	✓			
Railway and Marine Traffic Controllers	2275	✓			
Railway and Motor Transport Labourers	7622	✓			
Railway and Yard Locomotive Engineers	7361	✓			
Railway Carmen/Women	7314	✓			
Railway Conductors and Brakemen/Women	7362	✓			
Railway Track Maintenance Workers	7432	✓			
Railway Yard Worker	7431	✓			
Retail Trade Manager	0621			✓	✓

Logistics continued

LOGISTICS continued

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupation Profile	NOC#	D	C	B	A
Sales Representatives, Wholesale Trade (non-technical)	6411				✓
Shippers and Receivers	1471	✓			
Supervisors, Motor Transport and Other Ground Transit Operators	7222	✓			
Supervisors, Recording, Distributing and Scheduling Occupations	1215	✓			
Taxi and Limousine Drivers and Chauffeurs	7413	✓			
Technical Inspector	2232	✓			
Ticket and Cargo Agents and Related Clerks (except Airline)	6434	✓			
Transportation Manager	0713				✓
Transportation Route and Crew Schedulers	1476	✓			
Truck Driver	7411	✓			

MANAGEMENT & MARKETING

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupation Profile	NOC#	D	C	B	A
Accommodation Services Manager	0632			✓	✓
Architecture and Science Managers	0212			✓	✓
Banking, Credit and Other Investment Managers	0122			✓	✓
Construction Managers	0711				✓
Display Designer/Visual Merchandiser	5243	✓		✓	
Economic Development Officers and Marketing Researchers and Consultants	4163				✓
Engineering Managers	0211				✓
Facility Operation Managers	0721			✓	✓
Financial Managers	0111			✓	✓
Information Systems and Data Processing Managers	0213				✓
Insurance, Real Estate and Financial Brokerage Managers	0121			✓	✓
Maintenance Managers	0722	✓		✓	✓
Managers in Health Care	0411			✓	✓
Managers in Publishing, Motion Pictures, Broadcasting and Performing Arts	0512			✓	✓
Managers in Social, Community and Correctional Services	0411				✓
Marketing Manager	0611			✓	✓
Market Research Analyst	4163			✓	✓
Manufacturing Managers	0911			✓	✓
Operations Manager	0122/0911			✓	✓
Operations Research Analysts	2161			✓	✓
Other Administrative Services Managers	0414			✓	✓
Other Business Services Managers	0123			✓	✓
Other Services Managers	0651	✓		✓	
Postal and Courier Services Managers	0123			✓	✓
Professional Occupations in Business Services to Management	1122			✓	✓
Property Management	1224	✓		✓	✓
Purchasing Managers and Buyers	0113			✓	✓
Restaurant and Food Service Managers	0631			✓	✓
Sales, Marketing and Advertising Managers	0611			✓	✓
Telecommunication Carriers Managers	0131				✓
Transportation Managers	0713				✓
Utilities Managers	0912			✓	✓
Volunteer Managers	4212			✓	

MECHANICS

D:	High School Education	B:	College or Vocational Education
C:	Apprenticeship	A:	University

Occupational Profile	NOC#	D	C	B	A
Agriculture Mechanic/Farm Equipment Mechanics	7216		✓	✓	
Aircraft Maintenance Engineers	7315	✓		✓	
Appliance Servicemen	7332		✓	✓	
Assemblers, Fabricators and Inspectors, Industrial Electrical Motors and Transformers	9485	✓		✓	
Auto Body Mechanics	7322		✓	✓	
Automotive Mechanical Installers and Servicers	7321	✓			
Carmen	7314	✓			
Construction Millwright and Industrial Mechanics (except Textile)	7311		✓	✓	
Contractors and Supervisors, Mechanic Trades	7216		✓	✓	
Electronic Assemblers, Fabricators, Inspectors and Testers	9483	✓			
Elevator Constructors and Mechanics	7318		✓	✓	
Heavy Duty Equipment Mechanics	7312		✓	✓	
Industrial Instrument Technicians and Mechanics	2243		✓	✓	
Machine Fitters	7316		✓	✓	
Machine Operators and Inspectors, Electrical Apparatus Manufacturing	9487	✓			
Machinists and Machining and Tooling Inspectors	7231		✓	✓	
Maintenance Managers	0722			✓	✓
Manufacturing Managers	0911			✓	✓
Mechanical Assemblers and Inspectors	2244	✓			
Mechanical Engineers	2132				✓
Mechanical Engineering Technologists	2232			✓	
Motor Mechanics	7321		✓		
Motorcycle Mechanics	7334		✓		
Motor Vehicle Body Repairs	7322		✓	✓	
Motor Vehicle Mechanics, Technicians and Mechanical Repairers	7322		✓	✓	
Oil and Solid Fuel Heating Mechanics	7331		✓	✓	
Other Small Engine and Equipment Mechanics	7335		✓	✓	
Other Trades and Related Occupations	7383		✓	✓	
Other Trades Helpers and Labourers	7612	✓			
Partsmen	1472		✓	✓	
Power Engineers	7351				✓
Refrigeration and Air Conditioning Mechanics	7313		✓	✓	
Recreation Vehicle Mechanics	7383		✓	✓	

Mechanics continued

MECHANICS continued

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Storekeepers and Parts Clerks	1472	✓		✓	
Supervisors, Machinists and Related Occupations	7211		✓	✓	
Supervisors, Motor Vehicle Assembling	9221	✓			
Supervisors, Other Mechanical and Metal Products Manufacturing	7211	✓			
Textile Machinery Mechanics and Repairers	7317	✓			
Tool and Die Makers	7232		✓	✓	
Transportation Refrigeration Mechanic	7313		✓	✓	

TOURISM STUDIES

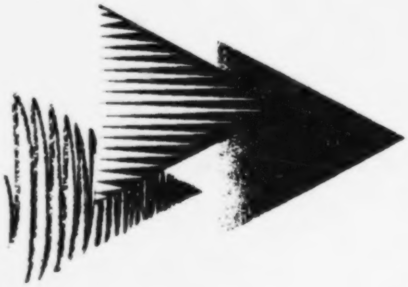
D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Accommodation Service Manager	0632				✓
Amusement Attraction Operators and Other Amusement Occupations	6443	✓			
Banquet Catering Supervisor	0631			✓	
Cashier	6611	✓			
Cleaning Supervisor	6215	✓			
Conference and Event Planners	1226			✓	
Customer Service, Information and Related Clerks	1453			✓	
Executive Housekeeper	6213			✓	✓
Guest Services Attendant	6661	✓			
Hotel Front Desk Clerk	6435			✓	
Interpretative Naturalist	2121				✓
Other Attendants in Accommodation and Travel	6672	✓			
Other Service Supervisors	6216	✓		✓	
Outdoor Sport and Recreation Guides	6442	✓			
Pursers and Flight Attendants	6432	✓			
Recreation and Sports Administrator/Director	0513				✓
Recreation Coordinator/Supervisor	4167			✓	
Recreation Facility Operator	6671	✓			
Sales Representatives, Wholesale Trade (non-Technical)	6421			✓	
Social Planner	4164				✓
Ticket Agent	6433/6434	✓			
Tour and Travel Guides	6441	✓			
Travel Counsellors/Consultants	6431			✓	

WILDLIFE

D: High School Education
C: Apprenticeship
B: College or Vocational Education
A: University

Occupation Profile	NOC#	D	C	B	A
Animal Health Technologists	3231			✓	
Biochemist	2112				✓
Biological Technician	2221				✓
Biologist and Related Scientist	2121				✓
Botanist	2121				✓
Chemist	2112				✓
Conservation and Fishery Officer	2224			✓	
Environmental Auditor	2263				✓
Environmental Education Specialist	4169				✓
Environmental Engineer	2131/2148				✓
Hazardous Waste Management Technician	2263			✓	
Hydrologist	2113				✓
Inspectors in Public and Environmental Heath and Occupational Health and Safety	2263			✓	✓
Marine Biologist	2121				✓
Oceanographer	2113				✓
Park Warden/Park Ranger	2224			✓	
Pest Control Operator/Exterminator	7444		✓		
Pollution Control Technician	2211			✓	
Trappers and Hunters	8442	✓			
Veterinarians	3114				✓
Wildlife, Habitat and Fish Biologist	2121				✓



CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 8:

CTS – IOP CONNECTIONS

August 1997 (Interim)

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This document was designed to help those responsible for implementing and coordinating the CTS and IOP programs to clarify how the two programs are similar and how they differ. This information should help when making decisions related to student placement and program delivery

CTS Team
August, 1997

Questions or comments about this document are welcomed and should be directed to:
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IOP–CTS CONNECTIONS

PURPOSE

With the implementation of the Career and Technology Studies (CTS) curriculum, the potential linkages with the Integrated Occupational Program (IOP) need to be clarified and communicated to teachers, counsellors and school administrators. This is a service document designed to help those responsible for implementing and coordinating the CTS and IOP programs to clarify how the two programs are similar and how they differ. This information should help when making decisions related to student placement and program delivery.

1. *Student Placement*

    - Should students be placed in an Integrated Occupational Program or into a general secondary program emphasizing CTS?
    - What are the most appropriate transition points for those IOP students who are able to meet competencies defined in selected strands/modules in the CTS curriculum?

2. *Program Delivery*

    - If students taking CTS modules and IOP - Occupational Component courses are included in the same class, how can teachers effectively deliver the two programs concurrently?

BACKGROUND

The Integrated Occupational Program (IOP) was implemented in Alberta junior and senior high schools in 1991. The IOP is a "stand-alone/comprehensive" program involving a required core component (math, science, language arts and social studies) and a complementary component involving 20 occupational areas. The IOP is designed for selected students who need special learning support systems, including hands-on learning experiences and remediation in mathematics, science, social studies and language arts. (See Appendix A for a list of the documents supporting the IOP).

The Career and Technology Studies program is now being implemented in junior and senior high schools across the province. CTS is a complementary program from which schools can design courses selecting from 22 strands and approximately 650 modules. CTS is available to all secondary students having the potential to meet the requirements for a high school diploma. (See Appendix B for a list of documents supporting the CTS program).

PROGRAM COMPARISON

CTS and the IOP should be compared primarily in the IOP occupational component. The following chart identifies which IOP occupational courses connect with 16 of the 22 CTS strands. Note that this comparison is based on the learning context as established in IOP student workbooks.

IOP OCCUPATIONAL COURSES*	RELATED CTS STRANDS
Agriculture Mechanics	Mechanics, Electro-Technologies
Agriculture Production	Agriculture
Horticultural Services	Agriculture
Business Services	Management and Marketing
Office Services	Information Processing
Building Services	Construction Technologies
Construction Services	Fabrication Studies
Crafts & Arts	Design Studies, Fashion Studies
Technical Arts	Communication Technology, Design Studies
Natural Resource Services	Energy and Mines, Forestry
Child and Health Care Services	Community Health
Esthetology	Cosmetology Studies
Fashion & Fabric Service	Fashion Studies
Hair Care, Esthetology	Cosmetology Studies
Commercial Food Preparation,	Foods
Food Services	Foods
Maintenance and Hospitality Services	Tourism
Automotive Services	Mechanics
Service Station Services	Mechanics
Warehouse Services	Management and Marketing, Logistics

*Note: ***This correlation chart does not include the locally developed IOP courses that are being implemented throughout the province.***

Some of the learnings in the following two Career and Technology Studies strands are integrated within the IOP as generic skills:

- Enterprise & Innovation
- Career Transitions.

In addition, four CTS strands, Legal Studies, Financial Management, Wildlife and Electro-Technologies do not have related IOP occupational courses.

Program Similarities

Both the Integrated Occupational Program and Career and Technology Studies programs are designed to:

- involve students in hands-on learning experiences
- assist student to develop competencies within a career-related context that will assist them in the transition into the workplace

Curriculum Focus	IOP	CTS
Life Skills	X	X
Career Awareness/Exploration	X	X
Workplace Transitions*	X	X
Post-secondary Transitions**	minimal	X

**includes related university, college and technical programs*
***includes apprenticeships*

- provide opportunities for students to develop a range of employability skills ("generic skills" in IOP, "basic competencies" in CTS). The following chart lists the "generic" and "basic competencies" that have been defined within the IOP and CTS.

IOP GENERIC SKILLS		CTS BASIC COMPETENCIES
Introductory Skills • Career Awareness • Job Search • Human Relations • Sanitation & Environment Awareness • Safety Organizational Skills • Ethics • Planning & Organization • Time Management • Work Standards	Communication Skills • Reading Skills • Writing Skills Mathematical Skills Visual Skills Entrepreneurship Community Partnerships Work Skills	Managing Learning Managing Resources Problem Solving and Innovation Communicating Effectively Working with Others Demonstrating Responsibility • Attendance • Safety • Ethics

Program Differences

The following chart outlines some of the ways in which the CTS and IOP programs differ.

Student Placement

	IOP	CTS
Target Group	At-risk students* (12.5 to 19 years of age)	All junior and senior high school students
Grade Levels	Specific curriculum designed for Grades 8, 9, 10, 11, 12	Designed around levels, not grades—introductory, intermediate, advanced (Grades 7–12)
Proportion of Student Population	IOP students represent 4-8% of the junior/senior high school population (In 1994-95, there were approximately 5,000 students in 180 schools)	100% of junior/senior high school students receive 3 or more credits in CTS
Learning Styles	Concrete learning experience	Concrete to abstract
Expectations for Student Performance	Students will be expected to demonstrate generic skills within an occupational context with limited emphasis on theory. Grading merges student ability and effort	Students must demonstrate a set of competencies to a specified standard, based on workplace and post-secondary expectations. Grading only occurs after the minimum competencies have been met
Credentialling Opportunities	A Certificate of Achievement is awarded to students who have completed **80 credits**: A minimum of 27 credits in academic courses, 13 credits in option courses and 40 credits in IOP occupational courses	A High School Diploma is awarded to students who have completed **100 credits**: and meet the requirements specified for the diploma Occupational credentialling options have been identified with specific modules.

Program Delivery

	IOP	CTS
On-campus Learning Experiences	*On-campus learning* (classroom/lab) is primarily used for core program and selected sections of occupational courses.	Most programs will be delivered on-campus, depending on school facilities and enrollments.
Off-campus Learning Experiences	*Community partnerships* is a **required** component for delivery of occupational courses. This may include off-campus learning, job shadowing and guest speakers.	*Off-campus learning* can be used to deliver competencies outlined in modules. Student achievement is reported using CTS modules assessment tools.

Funding

	IOP	CTS
Junior High School	Determined on basis on number of students enrolled in the school	Determined on basis on number of students enrolled in the school
Senior High School	IOP 16, 26, 36 courses funded on basis of 5/3 regular credit enrollment unit	CTS credits earned at the high school level funded on basis of credit enrollment units (1 module = 1 credit)

* *Typically, students entering IOP have a reading ability ranging from Grade 2 to Grade 5. For a more detailed profile of an IOP student, refer to the* IOP Manual for Administrators, Counsellors and Teachers, 1994.

CONSIDERATIONS FOR STUDENT TRANSITIONS

The following considerations will help identify, first, which IOP students are more likely to achieve success in making the transition into CTS, and second, strategies that will support IOP students in making the transition from IOP occupational courses to CTS strands/modules.

Indicators of Success

Many IOP students make the transition after they have completed their Grade 11 or Grade 12 IOP programs and then work towards earning a high school diploma. One of the key indicators of success is the student's performance in the IOP core programs. Students who demonstrate high levels of success in the IOP mathematics, science, language arts and social studies curriculum (16, 26, 36 courses) are more likely to be able to:

- handle the increased requirements in the CTS program to read, write, make calculations and measurements, and
- understand and apply the theory that is fundamental to technical processes.

Assisting IOP Students to Make a Successful Transition into CTS

Program Planning

Some IOP students may be able to achieve success in selected CTS strands and modules. The following chart describes the program planning options.

Program Planning Options	Program Components	Credential Received
Some IOP students take complete IOP program	IOP Core IOP Occupational Component	Certificate of Achievement
Some IOP students take combined IOP/CTS program	IOP Core CTS Strands/Modules	Certificate of Achievement
Some IOP students may move from an IOP (either before or after earning a Certificate of Achievement) to a general high school program, emphasizing CTS	Core requirements for High School Diploma CTS Strands/Modules	High School Diploma

Counsellors and teachers who are involved in helping IOP students select the CTS strands and modules in which they are most likely to be successful should refer to Section II: CTS Strands/Modules Related to IOP Occupational Courses. These scope and sequence charts identify the CTS modules that, based on the related IOP Occupational Workbooks (available through the Learning Resources Distribution Centre), will give the IOP student the greatest opportunity to achieve success in CTS. The specified modules (outlined in bold):

- include concepts that should have already been introduced within the related IOP occupational courses
- involve considerable hands-on learning with limited emphasis on theory
- tend to support workplace entry.

Note: These charts in no way indicate equivalency in student competency. Students who wish to make the transition into CTS modules should be informed of how the programs differ in expectations and learning environments. Assessment of prior learnings will assist the teacher and student to better identify how the IOP students entry-level knowledge, skills and attitudes relate to the CTS module learner expectation.

Learning Environment

CTS teachers can help IOP students make a successful transition into CTS by recognizing that the IOP student may need help in adjusting to a different learning environment. In general, the IOP learning environment is likely to be characterized by:

- smaller class sizes, allowing teachers to provide students with more individual assistance in building self-esteem and developing specific competencies
- more hands-on learning with minimal reference to occupation-related theory
- more recognition of student's ability to demonstrate "generic" skills (e.g., managing learning) within an occupational context, not necessarily career-specific competencies (e.g., welding skill)
- higher percentage grades may be given in IOP courses based on generic skills development than for equivalent career-specific competencies in CTS modules.

CONSIDERATIONS FOR CONCURRENT PROGRAM DELIVERY

Some schools schedule IOP students and CTS students in the same time block/facility. The following considerations may assist the IOP student to achieve success and help the teacher manage the additional challenge:

- use a combination of CTS and IOP curriculum and learning resources to deliver the required generic IOP learnings.
- clarify the different expectations the two programs have for student performance. IOP students will be primarily assessed on their ability to demonstrate generic skills in career-specific contexts and CTS students will be assessed on their ability to demonstrate a set of career-specific competencies to a specified standard.
- help IOP students to develop their academic competencies, particularly mathematics and language arts.
- provide IOP students with as much practice time as possible.

IOP–CTS CONNECTIONS

Summary: IOP–CTS Connection

The following potential connections identify CTS modules/strands in which IOP students may successfully transfer the skills they have developed through the 16–26–36 occupational courses. ***They do not indicate equivalency.*** IOP students wishing to receive credit in CTS modules must meet all of the module learner expectations to the standard set for each CTS module. The IOP student's level of competency can be assessed using the challenge provision.

	Jr. High Occupational Themes			Senior High School IOP Occupational Course Sequence																			
CTS STRANDS	Business Education	Personal & Public Service	Technical / Occupational	Agriculture Production	Agricultural Mechanics	Horticultural Services	Business Services	Office Services	Building Services	Construction Services	Crafts and Arts	Technical Arts	Natural Resource Services	Child and Health Care	Esthetology	Fashion & Fabric Services	Hair Care	Commercial Food Preparation	Food Services	Maintenance & Hospitality Services	Automotive Services	Service Station Services	Warehouse Services
Agriculture			▥	▥		▥																	
Career Transitions	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥	▥
Communication Technology			▥								▥	▥											
Community Health		■												■									
Construction Technologies			▥		▥				■	▥													
Cosmetology Studies															▥		▥						
Design Studies			▥								▥	▥											
Electro-Technologies																					▥	▥	
Energy and Mines			▥										▥										
Enterprise and Innovation																							
Fabrication Studies			▥		■					▥													
Fashion Studies											▥					▥							
Financial Management																							
Foods																		▥	▥				
Forestry			▥										▥										
Information Processing	■							■															
Legal Studies																							
Logistics																							▥
Management and Marketing	▥						■	■															
Mechanics			▥		■																■	■	
Tourism Studies																				▥			
Wildlife																							

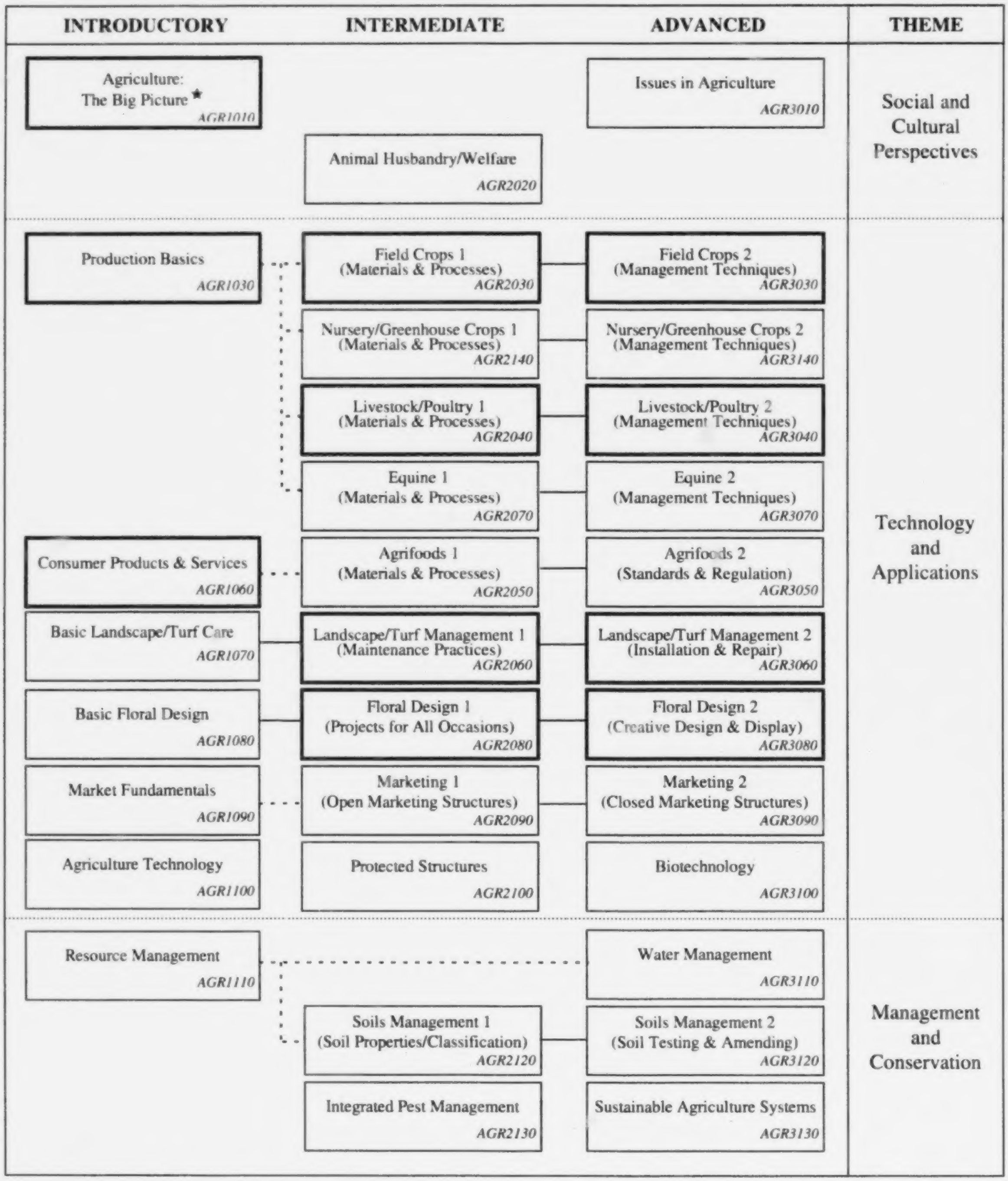
Based on the learnings defined in the IOP workbooks, **many** potential connections have been identified between the IOP and modules in the designated CTS strand. ■

Based on the learnings defined in the IOP workbooks, **some** potential connections have been identified between the IOP and modules in the designated CTS strand. ▥

POTENTIAL IOP–CTS CONNECTIONS: AGRICULTURE

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Agriculture: The Big Picture ★ AGR1010		Issues in Agriculture AGR3010	Social and Cultural Perspectives
	Animal Husbandry/Welfare AGR2020		
Production Basics AGR1030	**Field Crops 1 (Materials & Processes) AGR2030**	**Field Crops 2 (Management Techniques) AGR3030**	Technology and Applications
	Nursery/Greenhouse Crops 1 (Materials & Processes) AGR2140	Nursery/Greenhouse Crops 2 (Management Techniques) AGR3140	
	Livestock/Poultry 1 (Materials & Processes) AGR2040	**Livestock/Poultry 2 (Management Techniques) AGR3040**	
	Equine 1 (Materials & Processes) AGR2070	Equine 2 (Management Techniques) AGR3070	
Consumer Products & Services AGR1060	Agrifoods 1 (Materials & Processes) AGR2050	Agrifoods 2 (Standards & Regulation) AGR3050	
Basic Landscape/Turf Care AGR1070	**Landscape/Turf Management 1 (Maintenance Practices) AGR2060**	**Landscape/Turf Management 2 (Installation & Repair) AGR3060**	
Basic Floral Design AGR1080	**Floral Design 1 (Projects for All Occasions) AGR2080**	**Floral Design 2 (Creative Design & Display) AGR3080**	
Market Fundamentals AGR1090	Marketing 1 (Open Marketing Structures) AGR2090	Marketing 2 (Closed Marketing Structures) AGR3090	
Agriculture Technology AGR1100	Protected Structures AGR2100	Biotechnology AGR3100	
Resource Management AGR1110		Water Management AGR3110	Management and Conservation
	Soils Management 1 (Soil Properties/Classification) AGR2120	Soils Management 2 (Soil Testing & Amending) AGR3120	
	Integrated Pest Management AGR2130	Sustainable Agriculture Systems AGR3130	

—— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

POTENTIAL IOP–CTS CONNECTIONS: CTS STRAND: CAREER TRANSITIONS

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

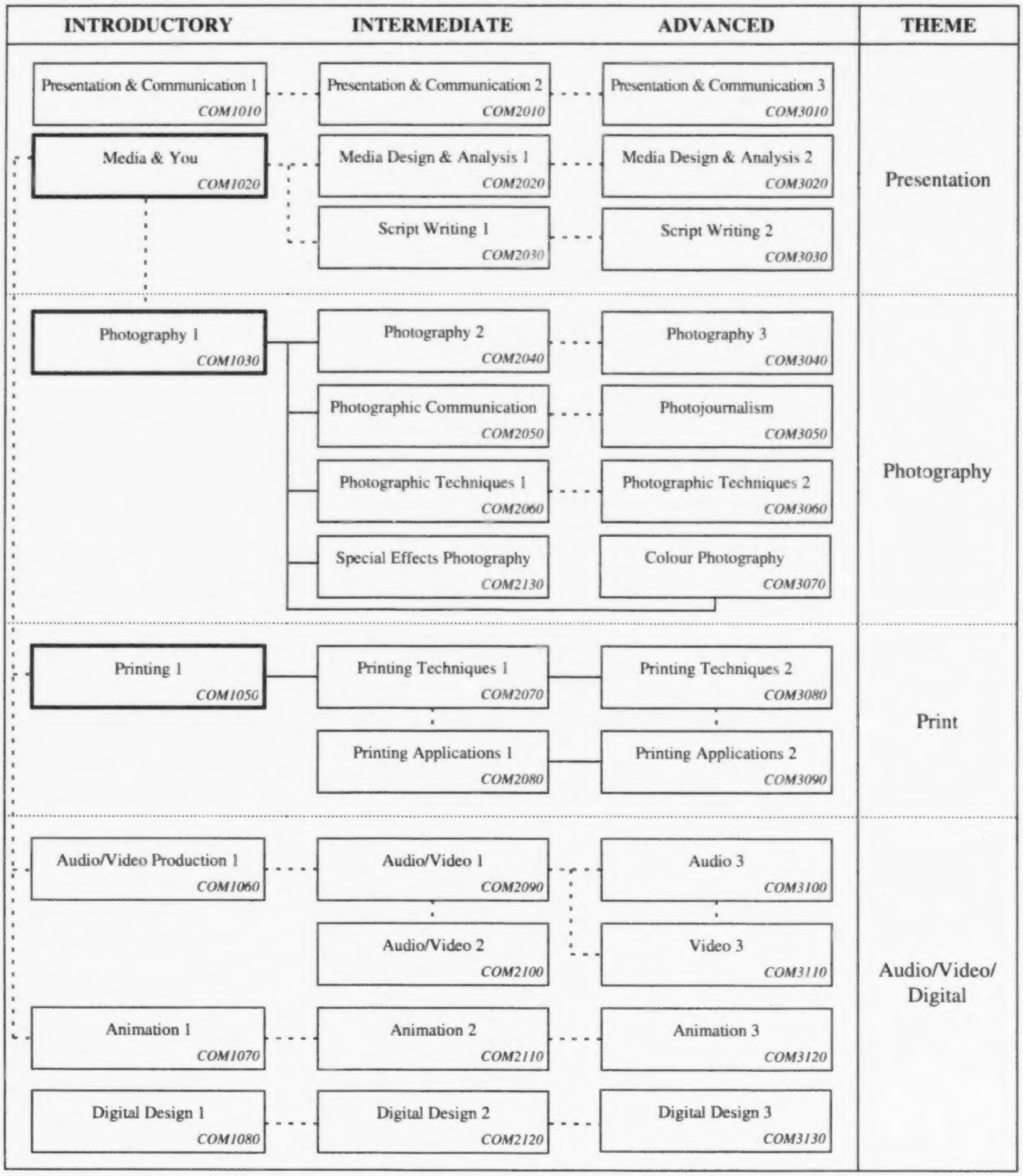
☐ Indicates a CTS module which related to and extends IOP learnings

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Job Preparation *CTR1010*	Job Maintenance *CTR2010*		Career Readiness
		Preparing for Change *CTR3010*	
Leading by Example *CTR1020*	Taking the Lead *CTR2020*	Organizational Leadership *CTR3020*	Leadership
	Governance & Leadership *CTR2030*	Leading for Change *CTR3030*	
Project 1A *CTR1110*	Project 2A *CTR2110*	Project 3A *CTR3110*	Career Extensions
Project 1B *CTR1120*	Project 2B *CTR2120*	Project 3B *CTR3120*	
	Project 2C *CTR2130*	Project 3C *CTR3130*	
	Project 2D *CTR2140*	Project 3D *CTR3140*	
	Project 2E *CTR2150*	Project 3E *CTR3150*	
		Practicum A *CTR3040*	Career Credentials
		Practicum B *CTR3050*	
		Practicum C *CTR3060*	
		Practicum D *CTR3070*	
		Practicum E *CTR3080*	
Personal Safety† (Management) *CTR1210*	Workplace Safety (Practices) *CTR2210*	Safety Management Systems *CTR3210*	Job Safety Skills

POTENTIAL IOP–CTS CONNECTIONS: COMMUNICATION TECHNOLOGY

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Presentation & Communication 1 COM1010	Presentation & Communication 2 COM2010	Presentation & Communication 3 COM3010	Presentation
Media & You COM1020	Media Design & Analysis 1 COM2020	Media Design & Analysis 2 COM3020	
	Script Writing 1 COM2030	Script Writing 2 COM3030	
Photography 1 COM1030	Photography 2 COM2040	Photography 3 COM3040	Photography
	Photographic Communication COM2050	Photojournalism COM3050	
	Photographic Techniques 1 COM2060	Photographic Techniques 2 COM3060	
	Special Effects Photography COM2130	Colour Photography COM3070	
Printing 1 COM1050	Printing Techniques 1 COM2070	Printing Techniques 2 COM3080	Print
	Printing Applications 1 COM2080	Printing Applications 2 COM3090	
Audio/Video Production 1 COM1060	Audio/Video 1 COM2090	Audio 3 COM3100	Audio/Video/ Digital
	Audio/Video 2 COM2100	Video 3 COM3110	
Animation 1 COM1070	Animation 2 COM2110	Animation 3 COM3120	
Digital Design 1 COM1080	Digital Design 2 COM2120	Digital Design 3 COM3130	

——— Prerequisite

- - - - Recommended sequence

POTENTIAL IOP–CTS CONNECTIONS: COMMUNITY HEALTH

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Family Dynamics *CMH1010*	Adolescent Health Issues *CMH2010*	Family Issues *CMH3010*	Sociocultural Perspectives
	Perspectives on Marriage *CMH2020*	Parenting *CMH3020*	
	Community Volunteerism *CMH2030*	Aging *CMH3030*	
Caring for Children *CMH1040*		Prenatal & Postnatal Care *CMH3040*	Skills for Caring
Child Development *CMH1050*	**Day Care 1** *CMH2050*	**Day Care 2** *CMH3050*	
Home Care 1 *CMH1060*	Home Care 2 (Personal Care Services) *CMH2060*	Home Care 3 (Special Conditions) *CMH3060*	
	Sensory Challenges *CMH2070*	Challenged Individuals *CMH3070*	
Perspectives on Health *CMH1080*	Respiratory System *CMH2080*	Digestive System *CMH3080*	Health Sciences
	Circulatory System *CMH2090*	Nervous/Endocrine Systems *CMH3090*	
	Musculoskeletal System *CMH2100*	Mental Health *CMH3100*	
	Complementary Therapies *CMH2110*	Advances in Medical Technology *CMH3110*	
Personal Safety (Management)† *CTR1210*	First Aid/CPR *CMH2120*	FirstAid/CPR for Children *CMH3120*	Injury Prevention
	Sports First Aid 1 *CMH2130*	Sports First Aid 2 *CMH3130*	

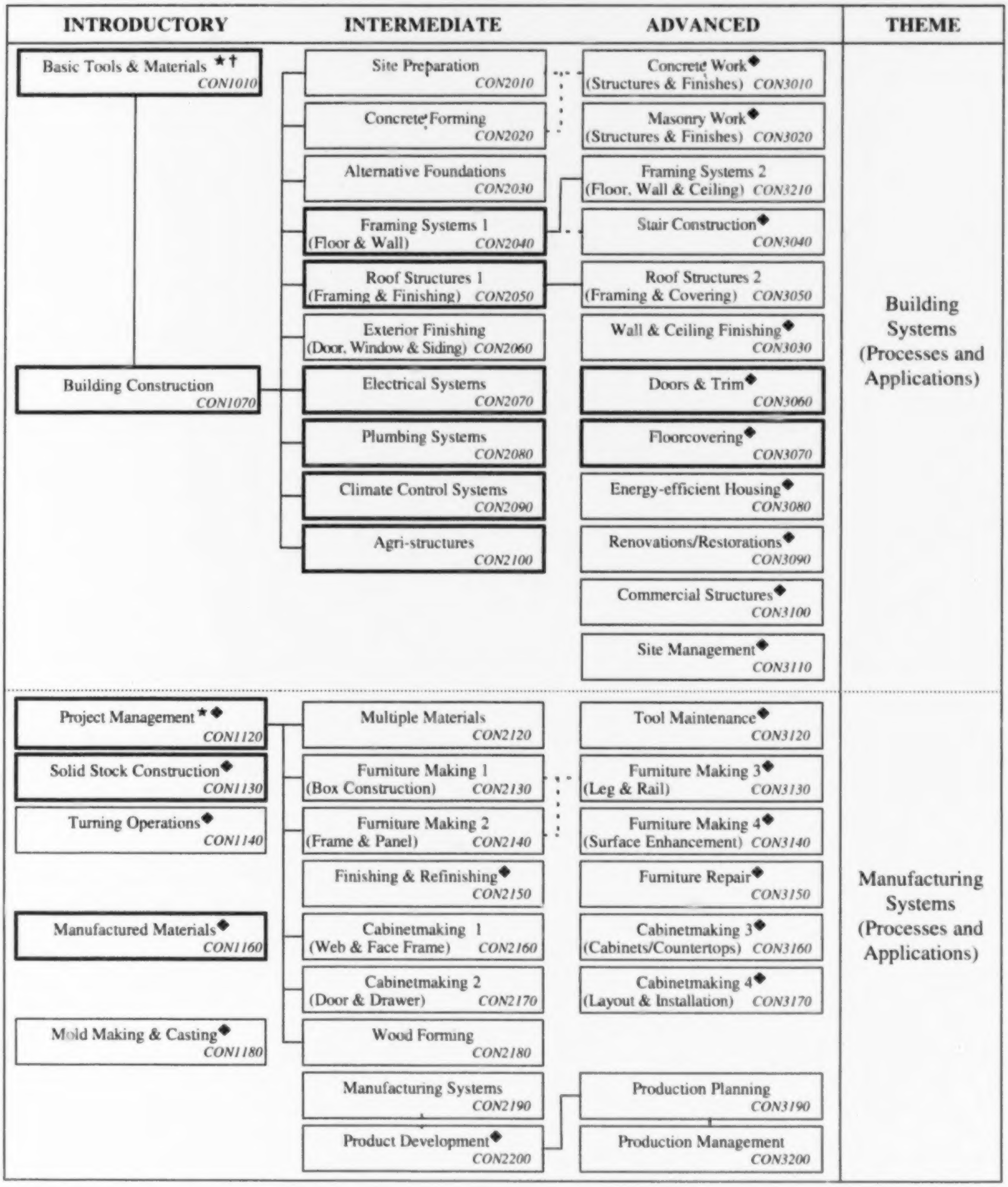
——— Prerequisite - - - - Recommended sequence

† Module is also offered in Career Transitions.

POTENTIAL IOP–CTS CONNECTIONS: CONSTRUCTION TECHNOLOGIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Basic Tools & Materials ★† CON1010	Site Preparation CON2010	Concrete Work◆ (Structures & Finishes) CON3010	Building Systems (Processes and Applications)
	Concrete Forming CON2020	Masonry Work◆ (Structures & Finishes) CON3020	
	Alternative Foundations CON2030	Framing Systems 2 (Floor, Wall & Ceiling) CON3210	
	Framing Systems 1 (Floor & Wall) CON2040	Stair Construction◆ CON3040	
	Roof Structures 1 (Framing & Finishing) CON2050	Roof Structures 2 (Framing & Covering) CON3050	
	Exterior Finishing (Door, Window & Siding) CON2060	Wall & Ceiling Finishing◆ CON3030	
Building Construction CON1070	**Electrical Systems CON2070**	**Doors & Trim◆ CON3060**	
	Plumbing Systems CON2080	**Floorcovering◆ CON3070**	
	Climate Control Systems CON2090	Energy-efficient Housing◆ CON3080	
	Agri-structures CON2100	Renovations/Restorations◆ CON3090	
		Commercial Structures◆ CON3100	
		Site Management◆ CON3110	
Project Management★◆ CON1120	Multiple Materials CON2120	Tool Maintenance◆ CON3120	Manufacturing Systems (Processes and Applications)
Solid Stock Construction◆ CON1130	Furniture Making 1 (Box Construction) CON2130	Furniture Making 3◆ (Leg & Rail) CON3130	
Turning Operations◆ CON1140	Furniture Making 2 (Frame & Panel) CON2140	Furniture Making 4◆ (Surface Enhancement) CON3140	
	Finishing & Refinishing◆ CON2150	Furniture Repair◆ CON3150	
Manufactured Materials◆ CON1160	Cabinetmaking 1 (Web & Face Frame) CON2160	Cabinetmaking 3◆ (Cabinets/Countertops) CON3160	
	Cabinetmaking 2 (Door & Drawer) CON2170	Cabinetmaking 4◆ (Layout & Installation) CON3170	
Mold Making & Casting◆ CON1180	Wood Forming CON2180		
	Manufacturing Systems CON2190	Production Planning CON3190	
	Product Development◆ CON2200	Production Management CON3200	

——— Prerequisite

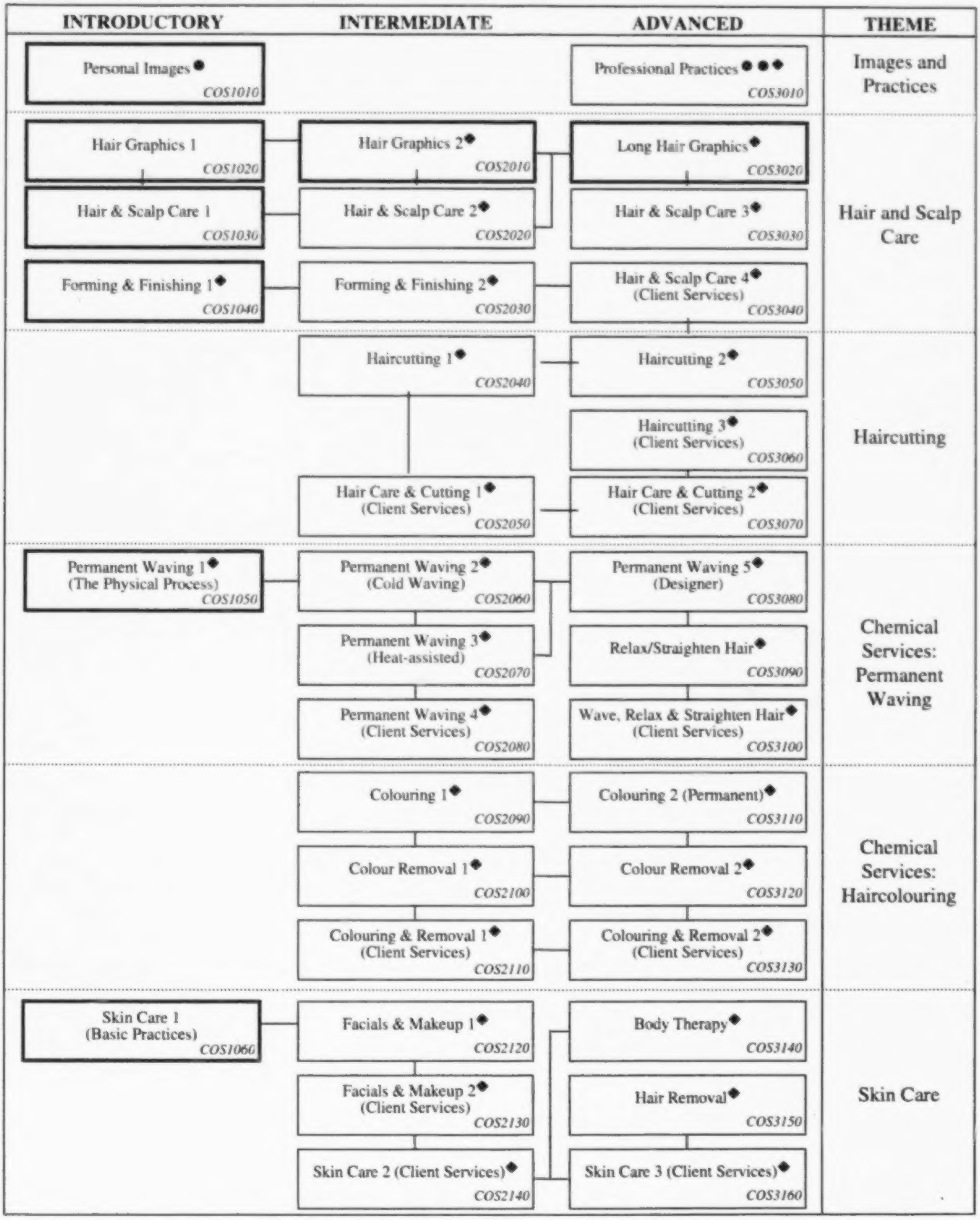
- - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
† Module is also offered in Fabrication Studies.
◆ Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: COSMETOLOGY STUDIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Personal Images ● COS1010		Professional Practices ●●◆ COS3010	Images and Practices
Hair Graphics 1 COS1020	**Hair Graphics 2◆ COS2010**	**Long Hair Graphics◆ COS3020**	Hair and Scalp Care
Hair & Scalp Care 1 COS1030	Hair & Scalp Care 2◆ COS2020	Hair & Scalp Care 3◆ COS3030	
Forming & Finishing 1◆ COS1040	Forming & Finishing 2◆ COS2030	Hair & Scalp Care 4◆ (Client Services) COS3040	
	Haircutting 1◆ COS2040	Haircutting 2◆ COS3050	Haircutting
		Haircutting 3◆ (Client Services) COS3060	
	Hair Care & Cutting 1◆ (Client Services) COS2050	Hair Care & Cutting 2◆ (Client Services) COS3070	
Permanent Waving 1◆ (The Physical Process) COS1050	Permanent Waving 2◆ (Cold Waving) COS2060	Permanent Waving 5◆ (Designer) COS3080	Chemical Services: Permanent Waving
	Permanent Waving 3◆ (Heat-assisted) COS2070	Relax/Straighten Hair◆ COS3090	
	Permanent Waving 4◆ (Client Services) COS2080	Wave, Relax & Straighten Hair◆ (Client Services) COS3100	
	Colouring 1◆ COS2090	Colouring 2 (Permanent)◆ COS3110	Chemical Services: Haircolouring
	Colour Removal 1◆ COS2100	Colour Removal 2◆ COS3120	
	Colouring & Removal 1◆ (Client Services) COS2110	Colouring & Removal 2◆ (Client Services) COS3130	
Skin Care 1 (Basic Practices) COS1060	Facials & Makeup 1◆ COS2120	Body Therapy◆ COS3140	Skin Care
	Facials & Makeup 2◆ (Client Services) COS2130	Hair Removal◆ COS3150	
	Skin Care 2 (Client Services)◆ COS2140	Skin Care 3 (Client Services)◆ COS3160	

——— Prerequisite ‐ ‐ ‐ ‐ Recommended sequence

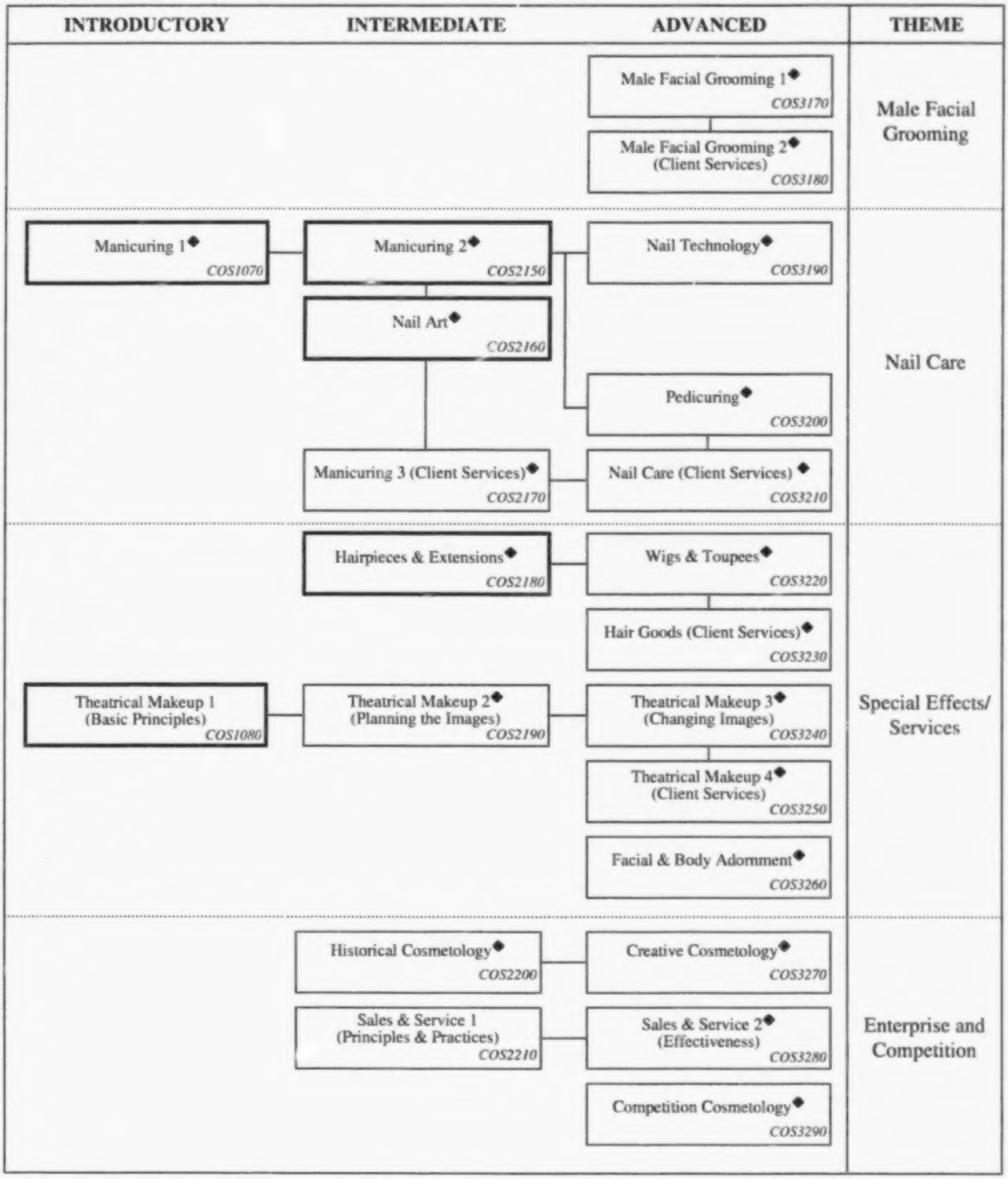
● Prerequisite to all introductory modules in this strand.

●● Prerequisite to all advanced modules in this strand

◆Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: (continued) COSMETOLOGY STUDIES

▭ Indicates a CTS module which related to and extends IOP learnings


INTRODUCTORY
INTERMEDIATE
ADVANCED
THEME
Male Facial Grooming 1◆ COS3170
Male Facial Grooming 2◆ (Client Services) COS3180
Male Facial Grooming
Manicuring 1◆ COS1070
Manicuring 2◆ COS2150
Nail Technology◆ COS3190
Nail Art◆ COS2160
Pedicuring◆ COS3200
Manicuring 3 (Client Services)◆ COS2170
Nail Care (Client Services)◆ COS3210
Nail Care
Hairpieces & Extensions◆ COS2180
Wigs & Toupees◆ COS3220
Hair Goods (Client Services)◆ COS3230
Theatrical Makeup 1 (Basic Principles) COS1080
Theatrical Makeup 2◆ (Planning the Images) COS2190
Theatrical Makeup 3◆ (Changing Images) COS3240
Theatrical Makeup 4◆ (Client Services) COS3250
Facial & Body Adornment◆ COS3260
Special Effects/ Services
Historical Cosmetology◆ COS2200
Creative Cosmetology◆ COS3270
Sales & Service 1 (Principles & Practices) COS2210
Sales & Service 2◆ (Effectiveness) COS3280
Competition Cosmetology◆ COS3290
Enterprise and Competition

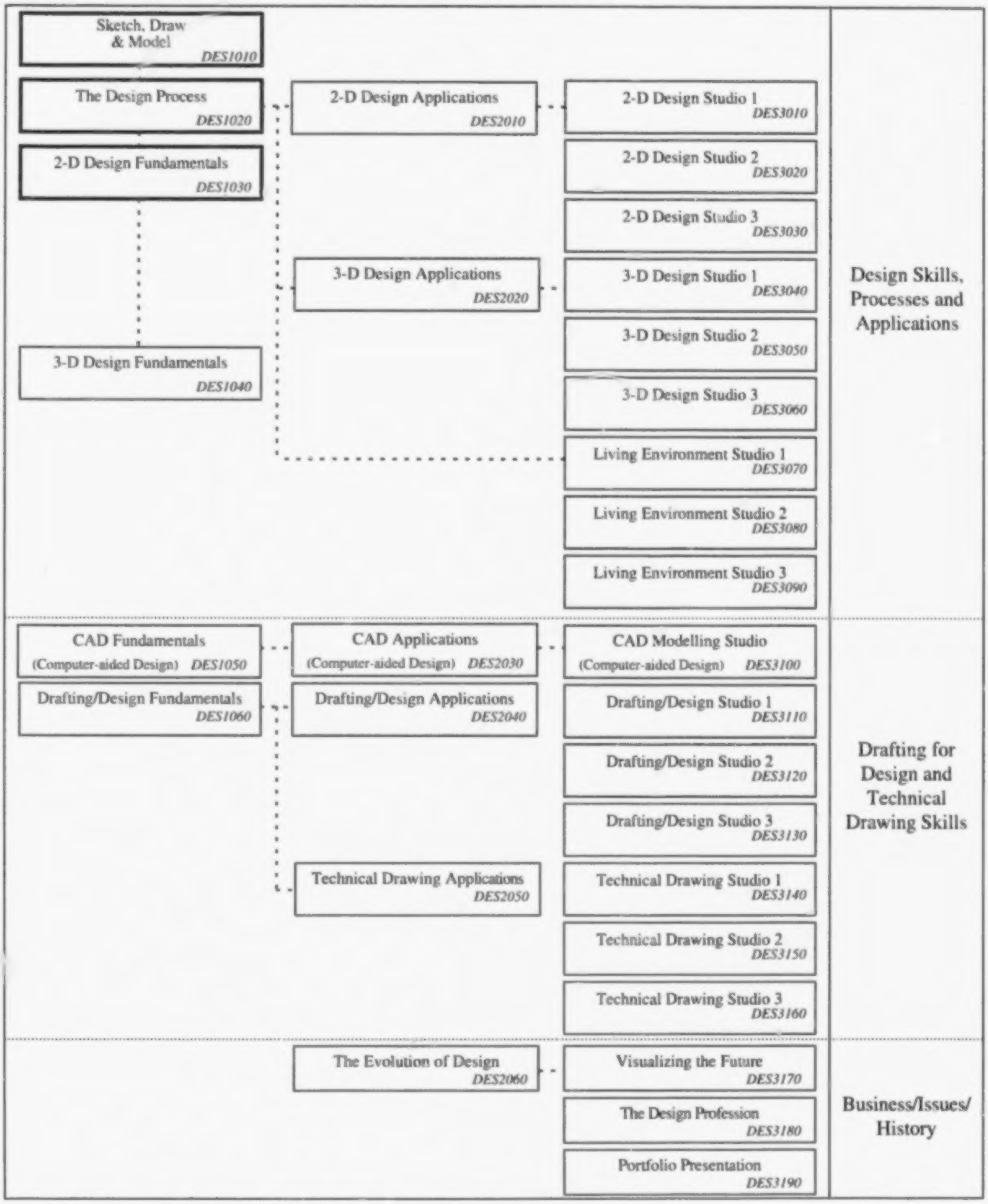
——— Prerequisite - - - - Recommended sequence

◆ Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: DESIGN STUDIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings

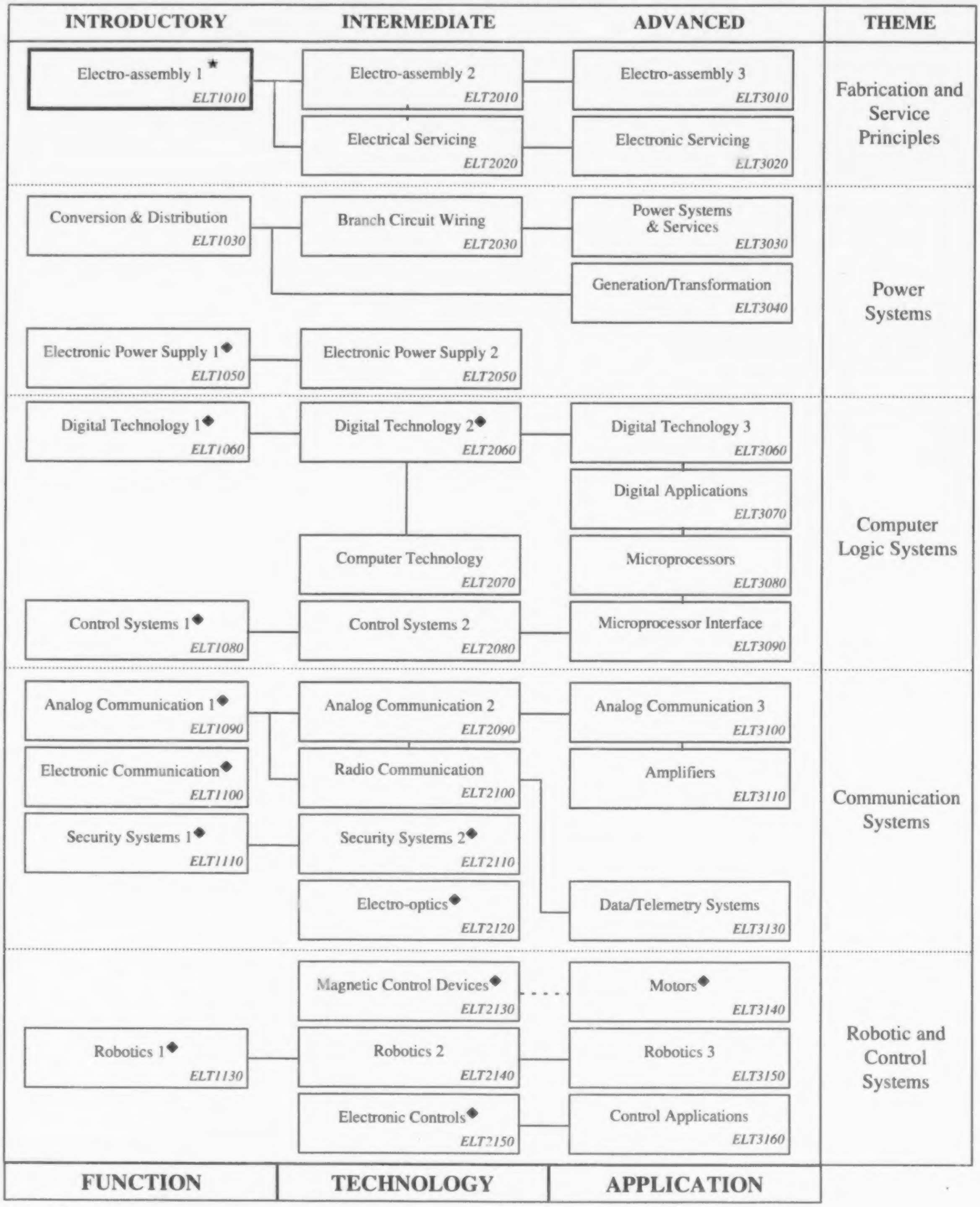

Sketch, Draw & Model DES1010
The Design Process DES1020
2-D Design Fundamentals DES1030
3-D Design Fundamentals DES1040
2-D Design Applications DES2010
3-D Design Applications DES2020
2-D Design Studio 1 DES3010
2-D Design Studio 2 DES3020
2-D Design Studio 3 DES3030
3-D Design Studio 1 DES3040
3-D Design Studio 2 DES3050
3-D Design Studio 3 DES3060
Living Environment Studio 1 DES3070
Living Environment Studio 2 DES3080
Living Environment Studio 3 DES3090
Design Skills, Processes and Applications
CAD Fundamentals (Computer-aided Design) DES1050
Drafting/Design Fundamentals DES1060
CAD Applications (Computer-aided Design) DES2030
Drafting/Design Applications DES2040
Technical Drawing Applications DES2050
CAD Modelling Studio (Computer-aided Design) DES3100
Drafting/Design Studio 1 DES3110
Drafting/Design Studio 2 DES3120
Drafting/Design Studio 3 DES3130
Technical Drawing Studio 1 DES3140
Technical Drawing Studio 2 DES3150
Technical Drawing Studio 3 DES3160
Drafting for Design and Technical Drawing Skills
The Evolution of Design DES2060
Visualizing the Future DES3170
The Design Profession DES3180
Portfolio Presentation DES3190
Business/Issues/ History

—— Prerequisite   - - - - Recommended sequence

POTENTIAL IOP–CTS CONNECTIONS: ELECTRO-TECHNOLOGIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Electro-assembly 1 ★ ELT1010	Electro-assembly 2 ELT2010	Electro-assembly 3 ELT3010	Fabrication and Service Principles
	Electrical Servicing ELT2020	Electronic Servicing ELT3020	
Conversion & Distribution ELT1030	Branch Circuit Wiring ELT2030	Power Systems & Services ELT3030	Power Systems
		Generation/Transformation ELT3040	
Electronic Power Supply 1◆ ELT1050	Electronic Power Supply 2 ELT2050		
Digital Technology 1◆ ELT1060	Digital Technology 2◆ ELT2060	Digital Technology 3 ELT3060	Computer Logic Systems
		Digital Applications ELT3070	
	Computer Technology ELT2070	Microprocessors ELT3080	
Control Systems 1◆ ELT1080	Control Systems 2 ELT2080	Microprocessor Interface ELT3090	
Analog Communication 1◆ ELT1090	Analog Communication 2 ELT2090	Analog Communication 3 ELT3100	Communication Systems
Electronic Communication◆ ELT1100	Radio Communication ELT2100	Amplifiers ELT3110	
Security Systems 1◆ ELT1110	Security Systems 2◆ ELT2110		
	Electro-optics◆ ELT2120	Data/Telemetry Systems ELT3130	
	Magnetic Control Devices◆ ELT2130	Motors◆ ELT3140	Robotic and Control Systems
Robotics 1◆ ELT1130	Robotics 2 ELT2140	Robotics 3 ELT3150	
	Electronic Controls◆ ELT2150	Control Applications ELT3160	
FUNCTION	TECHNOLOGY	APPLICATION	

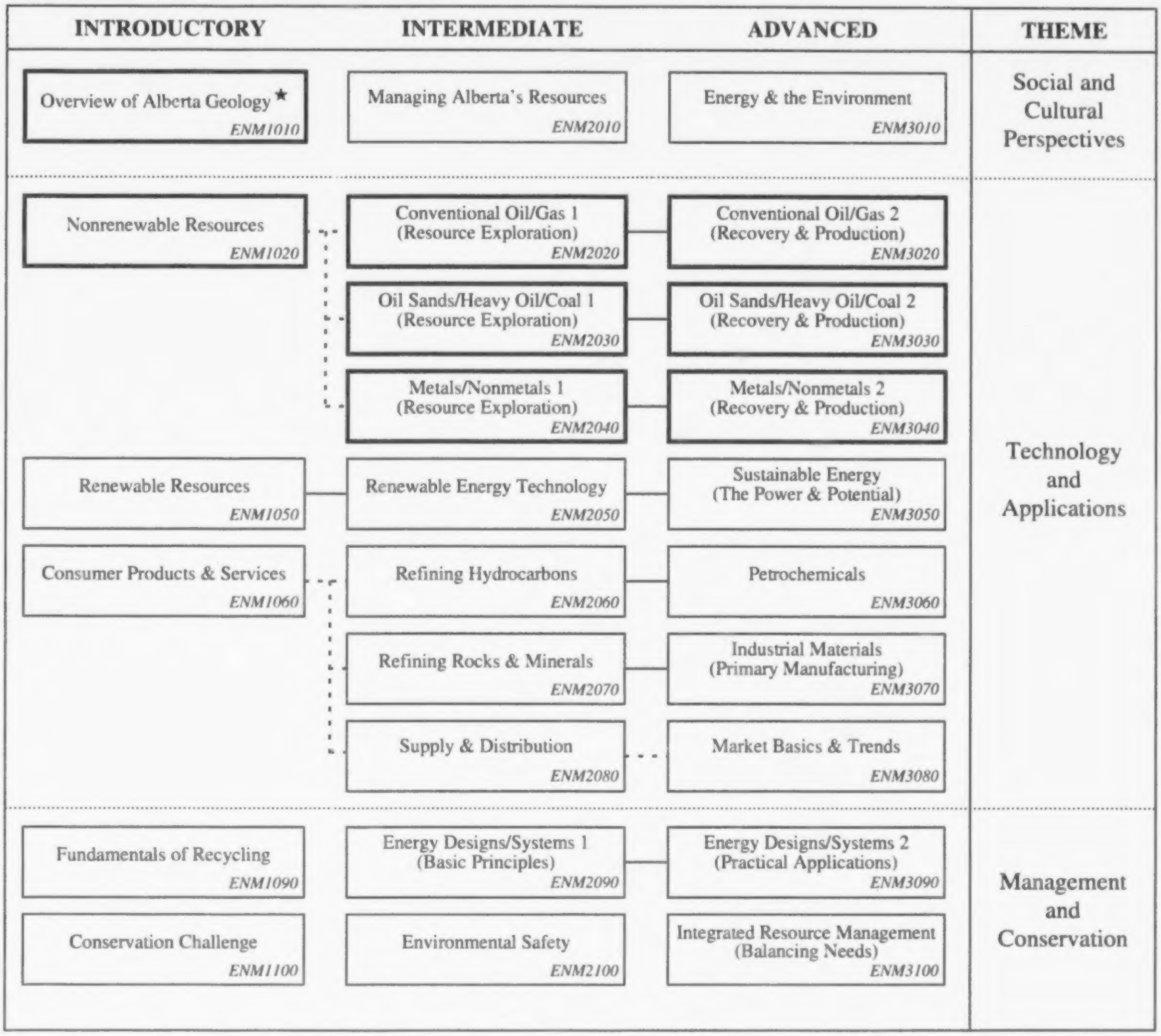
—— Prerequisite - - - - - Recommended sequence

†Refer to specific modules for additional prerequisites and recommended sequences.

POTENTIAL IOP–CTS CONNECTIONS: ENERGY AND MINES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Overview of Alberta Geology ★ ENM1010	Managing Alberta's Resources ENM2010	Energy & the Environment ENM3010	Social and Cultural Perspectives
Nonrenewable Resources ENM1020	**Conventional Oil/Gas 1 (Resource Exploration) ENM2020**	**Conventional Oil/Gas 2 (Recovery & Production) ENM3020**	Technology and Applications
	Oil Sands/Heavy Oil/Coal 1 (Resource Exploration) ENM2030	**Oil Sands/Heavy Oil/Coal 2 (Recovery & Production) ENM3030**	
	Metals/Nonmetals 1 (Resource Exploration) ENM2040	**Metals/Nonmetals 2 (Recovery & Production) ENM3040**	
Renewable Resources ENM1050	Renewable Energy Technology ENM2050	Sustainable Energy (The Power & Potential) ENM3050	
Consumer Products & Services ENM1060	Refining Hydrocarbons ENM2060	Petrochemicals ENM3060	
	Refining Rocks & Minerals ENM2070	Industrial Materials (Primary Manufacturing) ENM3070	
	Supply & Distribution ENM2080	Market Basics & Trends ENM3080	
Fundamentals of Recycling ENM1090	Energy Designs/Systems 1 (Basic Principles) ENM2090	Energy Designs/Systems 2 (Practical Applications) ENM3090	Management and Conservation
Conservation Challenge ENM1100	Environmental Safety ENM2100	Integrated Resource Management (Balancing Needs) ENM3100	

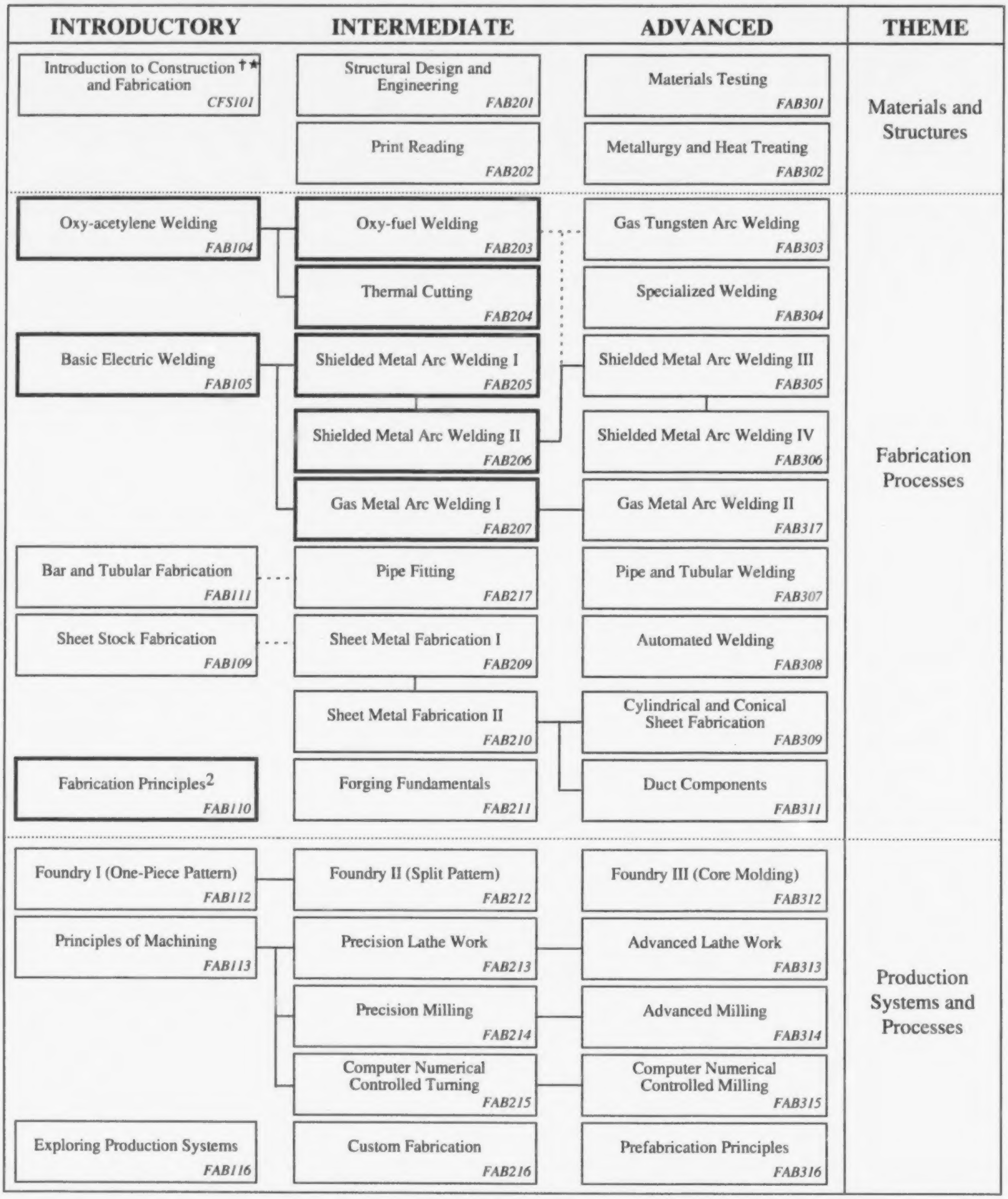
——— Prerequisite   - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.

POTENTIAL IOP–CTS CONNECTIONS: FABRICATION STUDIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Introduction to Construction and Fabrication †★ *CFS101*	Structural Design and Engineering *FAB201*	Materials Testing *FAB301*	Materials and Structures
	Print Reading *FAB202*	Metallurgy and Heat Treating *FAB302*	
Oxy-acetylene Welding *FAB104*	**Oxy-fuel Welding *FAB203***	Gas Tungsten Arc Welding *FAB303*	Fabrication Processes
	Thermal Cutting *FAB204*	Specialized Welding *FAB304*	
Basic Electric Welding *FAB105*	**Shielded Metal Arc Welding I *FAB205***	Shielded Metal Arc Welding III *FAB305*	
	Shielded Metal Arc Welding II *FAB206*	Shielded Metal Arc Welding IV *FAB306*	
	Gas Metal Arc Welding I *FAB207*	Gas Metal Arc Welding II *FAB317*	
Bar and Tubular Fabrication *FAB111*	Pipe Fitting *FAB217*	Pipe and Tubular Welding *FAB307*	
Sheet Stock Fabrication *FAB109*	Sheet Metal Fabrication I *FAB209*	Automated Welding *FAB308*	
	Sheet Metal Fabrication II *FAB210*	Cylindrical and Conical Sheet Fabrication *FAB309*	
Fabrication Principles² *FAB110*	Forging Fundamentals *FAB211*	Duct Components *FAB311*	
Foundry I (One-Piece Pattern) *FAB112*	Foundry II (Split Pattern) *FAB212*	Foundry III (Core Molding) *FAB312*	Production Systems and Processes
Principles of Machining *FAB113*	Precision Lathe Work *FAB213*	Advanced Lathe Work *FAB313*	
	Precision Milling *FAB214*	Advanced Milling *FAB314*	
	Computer Numerical Controlled Turning *FAB215*	Computer Numerical Controlled Milling *FAB315*	
Exploring Production Systems *FAB116*	Custom Fabrication *FAB216*	Prefabrication Principles *FAB316*	

—— Prerequisite ----- Recommended sequence

† Module is also offered in Construction Technologies.

★ This module provides a strong foundation for further learning in this strand.

2. Recommended corequisite.

POTENTIAL IOP–CTS CONNECTIONS: FASHION STUDIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

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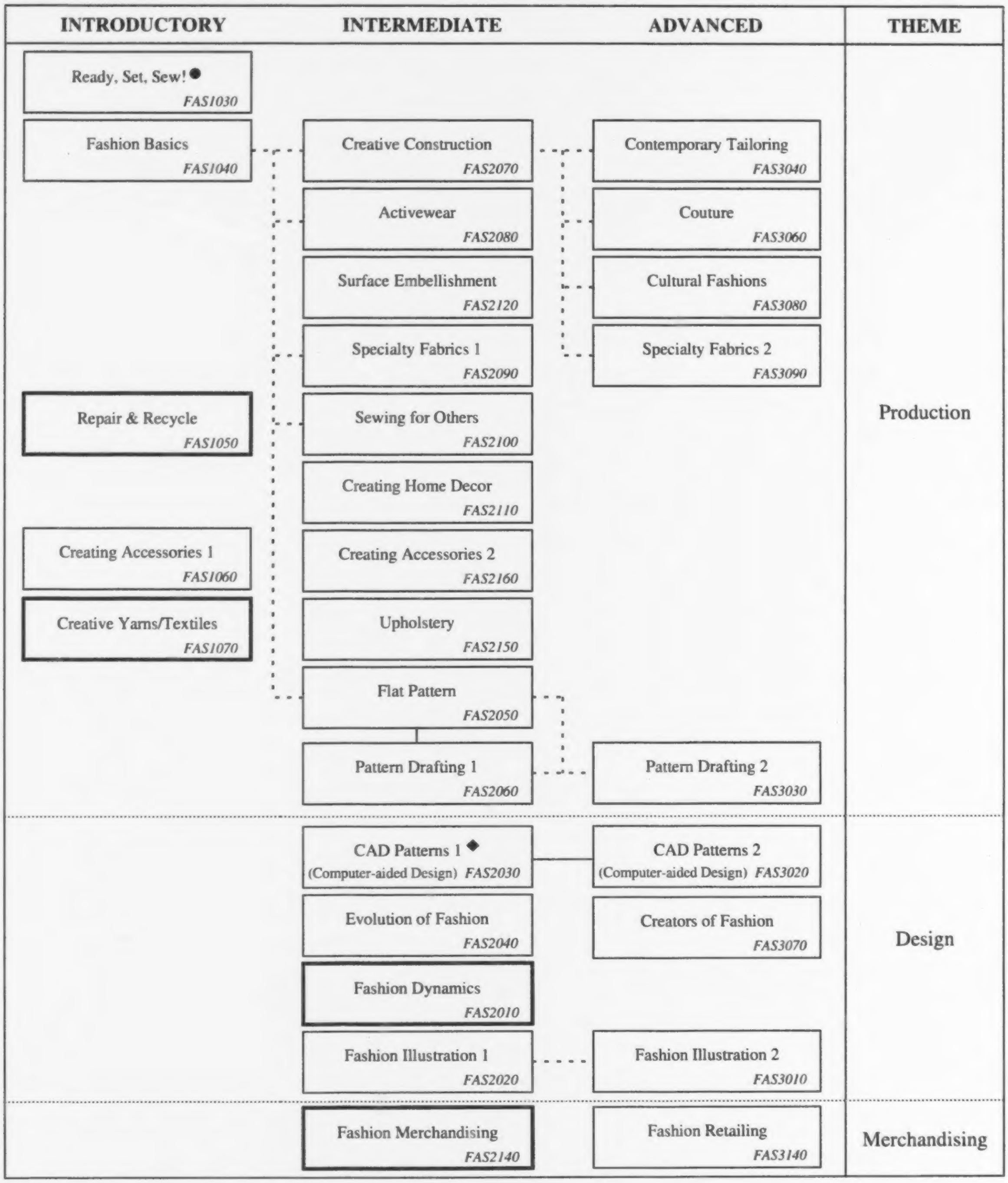


INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Ready, Set, Sew! ● FAS1030			Production
Fashion Basics FAS1040	Creative Construction FAS2070	Contemporary Tailoring FAS3040	
	Activewear FAS2080	Couture FAS3060	
	Surface Embellishment FAS2120	Cultural Fashions FAS3080	
	Specialty Fabrics 1 FAS2090	Specialty Fabrics 2 FAS3090	
Repair & Recycle FAS1050	Sewing for Others FAS2100		
	Creating Home Decor FAS2110		
Creating Accessories 1 FAS1060	Creating Accessories 2 FAS2160		
Creative Yarns/Textiles FAS1070	Upholstery FAS2150		
	Flat Pattern FAS2050		
	Pattern Drafting 1 FAS2060	Pattern Drafting 2 FAS3030	
	CAD Patterns 1 ◆ (Computer-aided Design) FAS2030	CAD Patterns 2 (Computer-aided Design) FAS3020	Design
	Evolution of Fashion FAS2040	Creators of Fashion FAS3070	
	Fashion Dynamics FAS2010		
	Fashion Illustration 1 FAS2020	Fashion Illustration 2 FAS3010	
	Fashion Merchandising FAS2140	Fashion Retailing FAS3140	Merchandising

—— Prerequisite - - - - Recommended sequence

● Prerequisite to all modules within the Production Theme, with the possible exceptions of FAS1070, FAS2120, FAS2150, FAS2160.

† Module is also offered in Design Studies.

◆ Refer to specific modules for additional prerequisites

POTENTIAL IOP–CTS CONNECTIONS: FOODS

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Food Basics ✠ *FOD1010*	Food & Nutrition Basics *FOD2010*	Food for the Life Cycle *FOD3010*	Nutrition
	Nutrition & the Athlete *FOD2020*	Nutrition & Digestion *FOD3020*	
	Food Decisions & Health *FOD2030*		
Baking Basics *FOD1020*	Cake & Pastry *FOD2040*	Creative Baking *FOD3030*	Preparation and Presentation
	Yeast Breads & Rolls *FOD2050*	Advanced Yeast Products *FOD3040*	
	Milk Products & Eggs *FOD2060*		
Snacks & Appetizers *FOD1030*	**Stocks, Soups & Sauces** *FOD2070*	Advanced Soups & Sauces *FOD3050*	
	Vegetables/Fruits/Grains *FOD2080*	Food Presentation *FOD3060*	
	Creative Cold Foods *FOD2090*	Short Order Cooking *FOD3070*	
	Basic Meat Cookery *FOD2100*	Advanced Meat Cookery *FOD3080*	
	Fish & Poultry *FOD2110*	Basic Meat Cutting *FOD3090*	
Meal Planning 1 *FOD1040*	Meal Planning 2 *FOD2120*	Entertaining with Food *FOD3100*	Management
	Vegetarian Cuisine *FOD2130*	Food Processing *FOD3110*	
Fast & Convenience Foods *FOD1050*	Rush Hour Cuisine *FOD2140*	Food Evolution/Innovation *FOD3120*	
	Food Safety & Sanitation *FOD2150*		
	Food Venture *FOD2160*	The Food Entrepreneur *FOD3130*	
Canadian Heritage Foods *FOD1060*	International Cuisine 1 *FOD2170*	International Cuisine 2 *FOD3140*	Social and Cultural

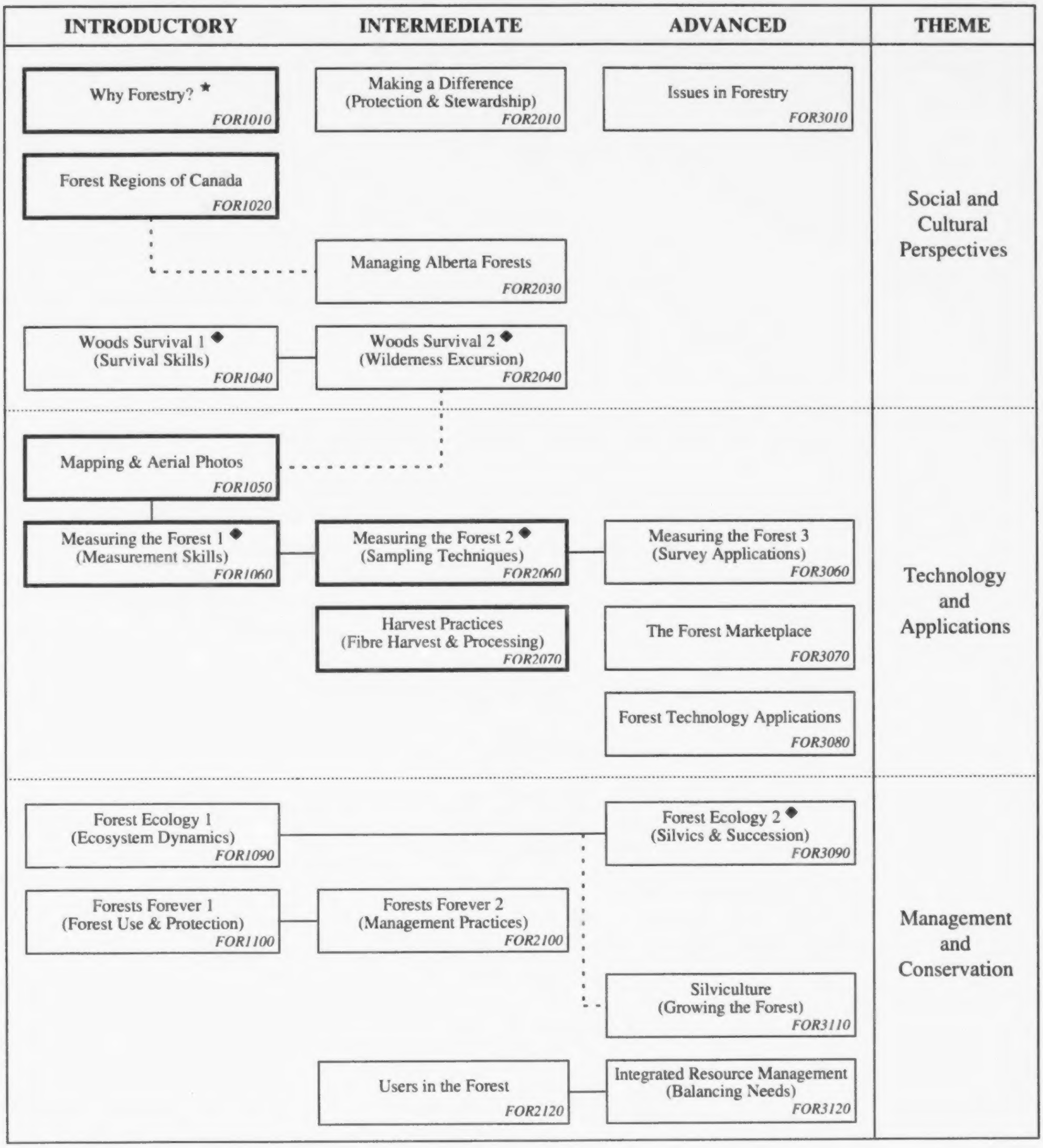
—— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand.

POTENTIAL IOP–CTS CONNECTIONS: FORESTRY

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Why Forestry? ★ FOR1010	Making a Difference (Protection & Stewardship) FOR2010	Issues in Forestry FOR3010	Social and Cultural Perspectives
Forest Regions of Canada FOR1020			
	Managing Alberta Forests FOR2030		
Woods Survival 1 ◆ (Survival Skills) FOR1040	Woods Survival 2 ◆ (Wilderness Excursion) FOR2040		
Mapping & Aerial Photos FOR1050			Technology and Applications
Measuring the Forest 1 ◆ (Measurement Skills) FOR1060	Measuring the Forest 2 ◆ (Sampling Techniques) FOR2060	Measuring the Forest 3 (Survey Applications) FOR3060	
	Harvest Practices (Fibre Harvest & Processing) FOR2070	The Forest Marketplace FOR3070	
		Forest Technology Applications FOR3080	
Forest Ecology 1 (Ecosystem Dynamics) FOR1090		Forest Ecology 2 ◆ (Silvics & Succession) FOR3090	Management and Conservation
Forests Forever 1 (Forest Use & Protection) FOR1100	Forests Forever 2 (Management Practices) FOR2100		
		Silviculture (Growing the Forest) FOR3110	
	Users in the Forest FOR2120	Integrated Resource Management (Balancing Needs) FOR3120	

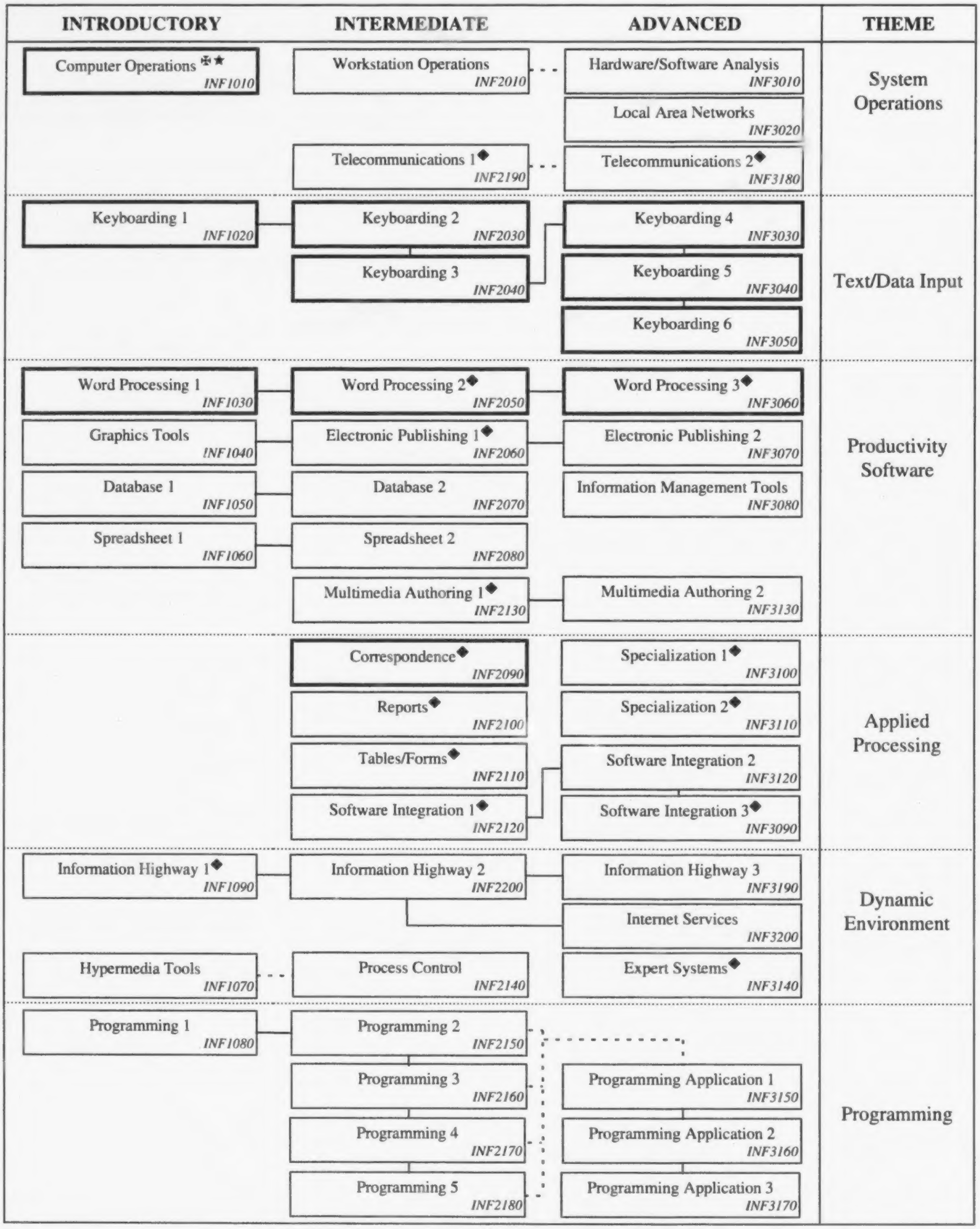
——— Prerequisite - - - - Recommended sequence

★ Module provides a strong foundation for further learning in this strand.
◆ Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: INFORMATION PROCESSING

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Computer Operations ✠★ INF1010	Workstation Operations INF2010	Hardware/Software Analysis INF3010	System Operations
		Local Area Networks INF3020	
	Telecommunications 1◆ INF2190	Telecommunications 2◆ INF3180	
Keyboarding 1 INF1020	Keyboarding 2 INF2030	Keyboarding 4 INF3030	Text/Data Input
	Keyboarding 3 INF2040	Keyboarding 5 INF3040	
		Keyboarding 6 INF3050	
Word Processing 1 INF1030	Word Processing 2◆ INF2050	Word Processing 3◆ INF3060	Productivity Software
Graphics Tools INF1040	Electronic Publishing 1◆ INF2060	Electronic Publishing 2 INF3070	
Database 1 INF1050	Database 2 INF2070	Information Management Tools INF3080	
Spreadsheet 1 INF1060	Spreadsheet 2 INF2080		
	Multimedia Authoring 1◆ INF2130	Multimedia Authoring 2 INF3130	
	Correspondence◆ INF2090	Specialization 1◆ INF3100	Applied Processing
	Reports◆ INF2100	Specialization 2◆ INF3110	
	Tables/Forms◆ INF2110	Software Integration 2 INF3120	
	Software Integration 1◆ INF2120	Software Integration 3◆ INF3090	
Information Highway 1◆ INF1090	Information Highway 2 INF2200	Information Highway 3 INF3190	Dynamic Environment
		Internet Services INF3200	
Hypermedia Tools INF1070	Process Control INF2140	Expert Systems◆ INF3140	
Programming 1 INF1080	Programming 2 INF2150		Programming
	Programming 3 INF2160	Programming Application 1 INF3150	
	Programming 4 INF2170	Programming Application 2 INF3160	
	Programming 5 INF2180	Programming Application 3 INF3170	

—— Prerequisite - - - - Recommended sequence ✠ Prerequisite to all modules in this strand. ★ Module provides a strong foundation for further learning in this strand.
◆ Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: LOGISTICS

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings

INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Logistics ✠ LOG1010			Introduction to Logistics
Warehouse & Distribute 1 LOG1020	**Warehouse & Distribute 2 LOG2010**	Warehouse & Distribute 3 LOG3010	Warehousing and Distribution
Traffic & Transport 1 LOG1030	Traffic & Transport 2 LOG2020	Traffic & Transport 3 LOG3020	Traffic and Transportation
Purchasing 1 LOG1040	Purchasing 2 LOG2030	Purchasing 3 LOG3030	Purchasing
	Inventory Management 1 LOG2040	Inventory Management 2 LOG3040	Inventory Management and Control

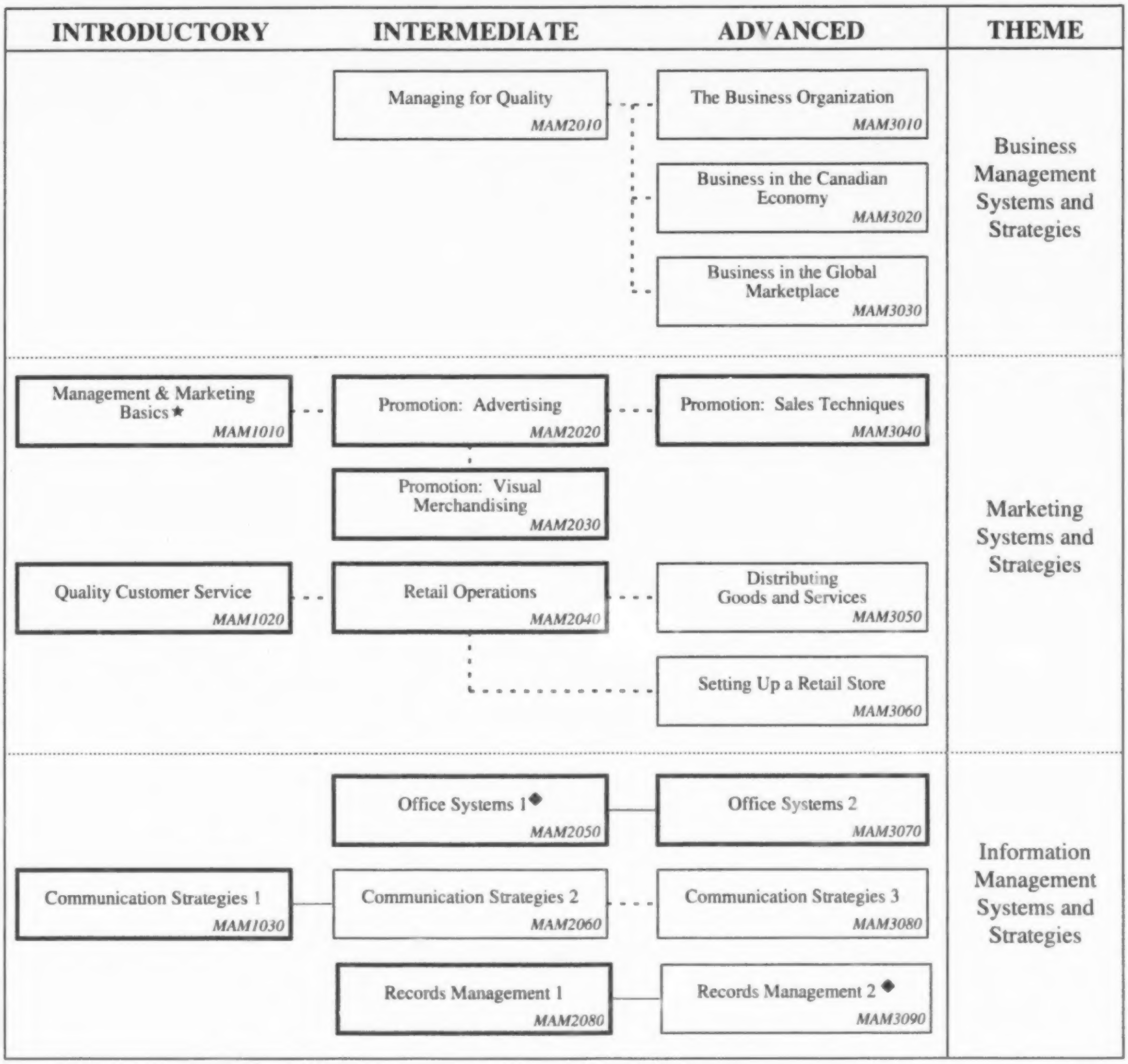
—— Prerequisite - - - - Recommended sequence

✠ Prerequisite to all modules in this strand.

POTENTIAL IOP–CTS CONNECTIONS: MANAGEMENT AND MARKETING

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

▭ Indicates a CTS module which related to and extends IOP learnings


INTRODUCTORY
INTERMEDIATE
ADVANCED
THEME
Managing for Quality MAM2010
The Business Organization MAM3010
Business in the Canadian Economy MAM3020
Business in the Global Marketplace MAM3030
Business Management Systems and Strategies
Management & Marketing Basics★ MAM1010
Promotion: Advertising MAM2020
Promotion: Sales Techniques MAM3040
Promotion: Visual Merchandising MAM2030
Quality Customer Service MAM1020
Retail Operations MAM2040
Distributing Goods and Services MAM3050
Setting Up a Retail Store MAM3060
Marketing Systems and Strategies
Office Systems 1◆ MAM2050
Office Systems 2 MAM3070
Communication Strategies 1 MAM1030
Communication Strategies 2 MAM2060
Communication Strategies 3 MAM3080
Records Management 1 MAM2080
Records Management 2◆ MAM3090
Information Management Systems and Strategies

——— Prerequisite - - - - Recommended sequence

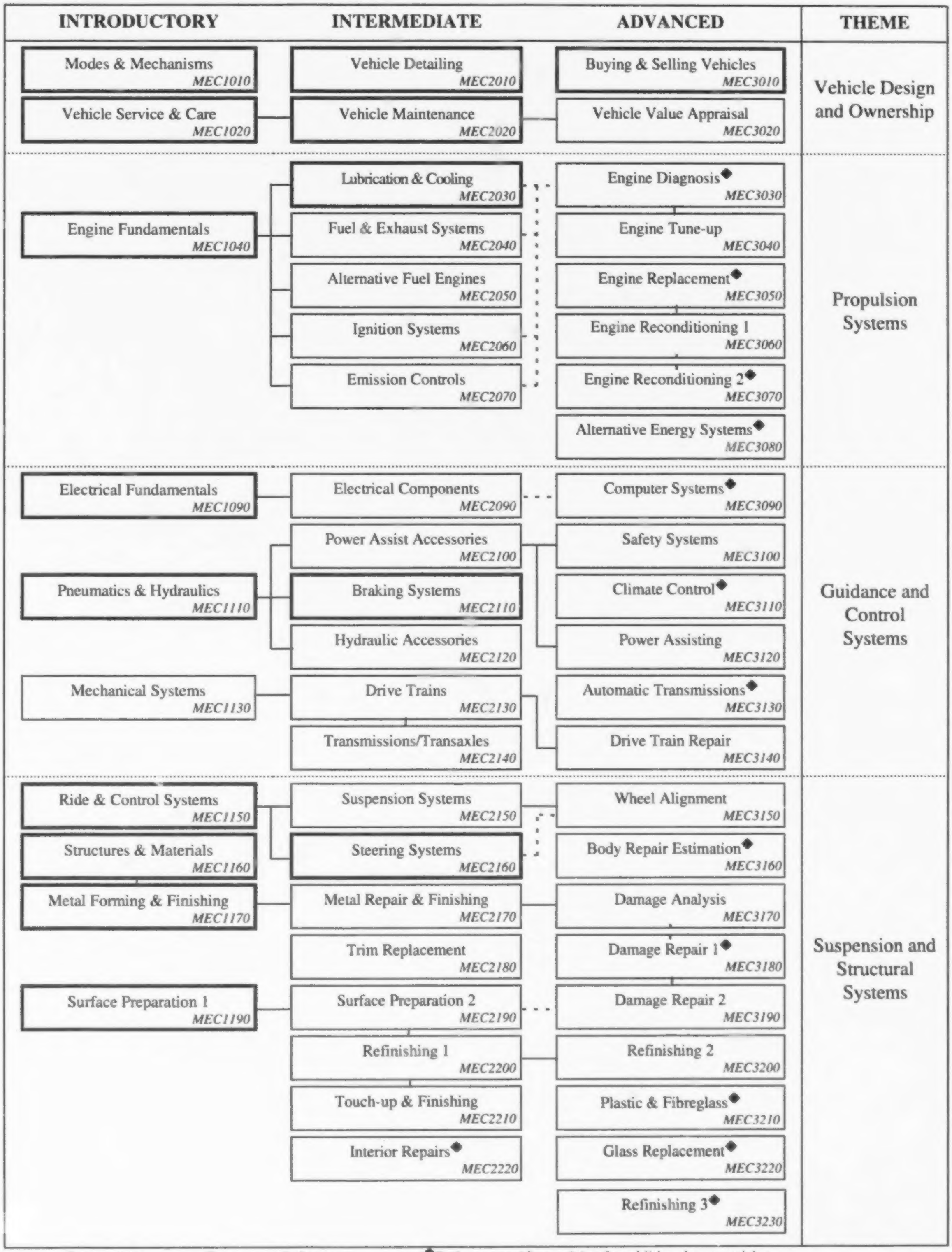
★ Module provides a strong foundation for further learning in this strand.

◆ Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: MECHANICS

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



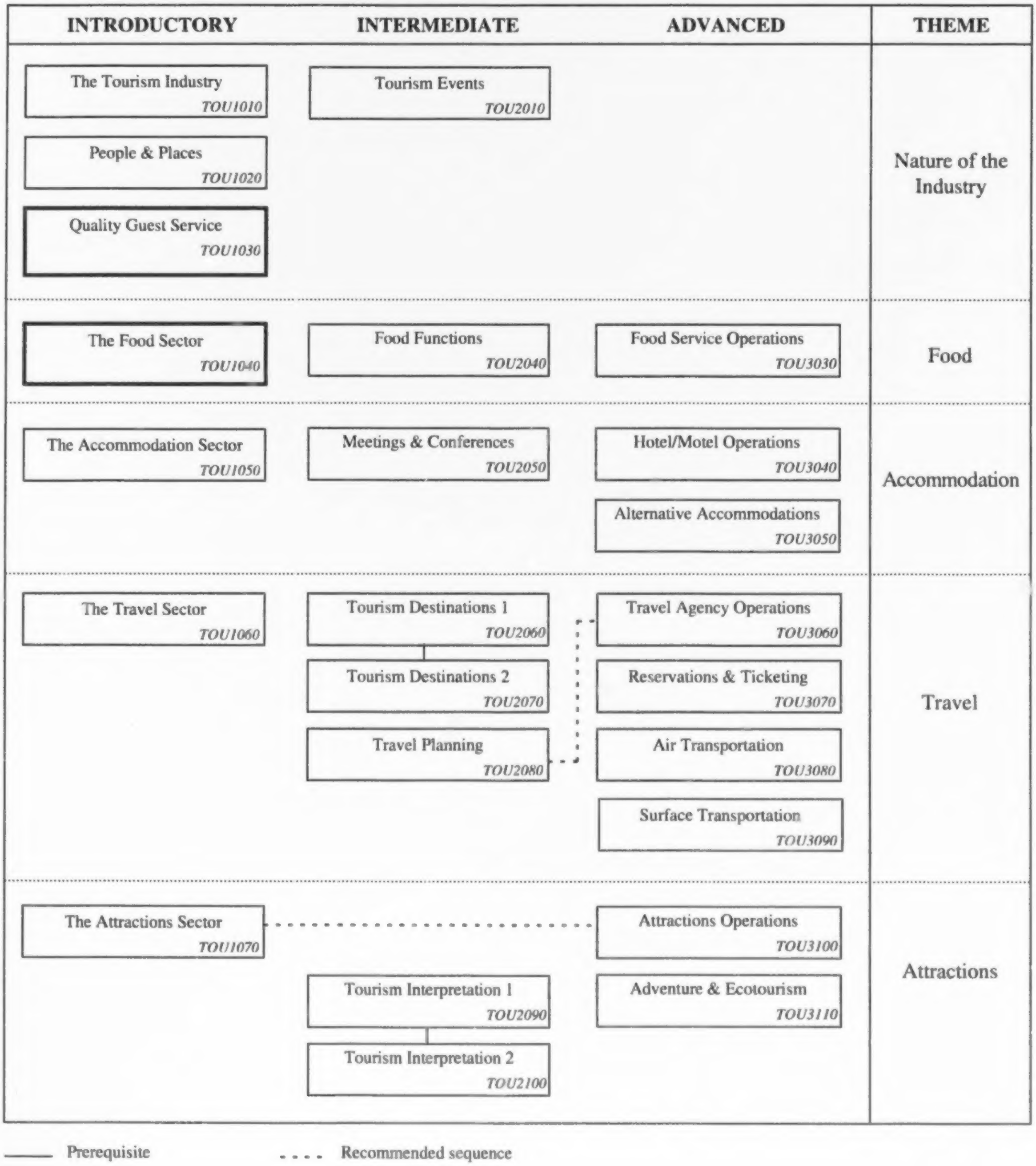
INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
Modes & Mechanisms *MEC1010*	**Vehicle Detailing** *MEC2010*	**Buying & Selling Vehicles** *MEC3010*	Vehicle Design and Ownership
Vehicle Service & Care *MEC1020*	**Vehicle Maintenance** *MEC2020*	Vehicle Value Appraisal *MEC3020*	
	Lubrication & Cooling *MEC2030*	Engine Diagnosis◆ *MEC3030*	Propulsion Systems
Engine Fundamentals *MEC1040*	Fuel & Exhaust Systems *MEC2040*	Engine Tune-up *MEC3040*	
	Alternative Fuel Engines *MEC2050*	Engine Replacement◆ *MEC3050*	
	Ignition Systems *MEC2060*	Engine Reconditioning 1 *MEC3060*	
	Emission Controls *MEC2070*	Engine Reconditioning 2◆ *MEC3070*	
		Alternative Energy Systems◆ *MEC3080*	
Electrical Fundamentals *MEC1090*	Electrical Components *MEC2090*	Computer Systems◆ *MEC3090*	Guidance and Control Systems
	Power Assist Accessories *MEC2100*	Safety Systems *MEC3100*	
Pneumatics & Hydraulics *MEC1110*	**Braking Systems** *MEC2110*	Climate Control◆ *MEC3110*	
	Hydraulic Accessories *MEC2120*	Power Assisting *MEC3120*	
Mechanical Systems *MEC1130*	Drive Trains *MEC2130*	Automatic Transmissions◆ *MEC3130*	
	Transmissions/Transaxles *MEC2140*	Drive Train Repair *MEC3140*	
Ride & Control Systems *MEC1150*	Suspension Systems *MEC2150*	Wheel Alignment *MEC3150*	Suspension and Structural Systems
Structures & Materials *MEC1160*	**Steering Systems** *MEC2160*	Body Repair Estimation◆ *MEC3160*	
Metal Forming & Finishing *MEC1170*	Metal Repair & Finishing *MEC2170*	Damage Analysis *MEC3170*	
	Trim Replacement *MEC2180*	Damage Repair 1◆ *MEC3180*	
Surface Preparation 1 *MEC1190*	Surface Preparation 2 *MEC2190*	Damage Repair 2 *MEC3190*	
	Refinishing 1 *MEC2200*	Refinishing 2 *MEC3200*	
	Touch-up & Finishing *MEC2210*	Plastic & Fibreglass◆ *MEC3210*	
	Interior Repairs◆ *MEC2220*	Glass Replacement◆ *MEC3220*	
		Refinishing 3◆ *MEC3230*	

——— Prerequisite - - - - Recommended sequence ◆Refer to specific modules for additional prerequisites.

POTENTIAL IOP–CTS CONNECTIONS: TOURISM STUDIES

The highlighted modules identify learnings in CTS that relate to and extend competencies IOP students will have developed if they have completed the 16–26–36 occupational courses.

☐ Indicates a CTS module which related to and extends IOP learnings



INTRODUCTORY	INTERMEDIATE	ADVANCED	THEME
The Tourism Industry *TOU1010* People & Places *TOU1020* **Quality Guest Service** *TOU1030*	Tourism Events *TOU2010*		Nature of the Industry
The Food Sector *TOU1040*	Food Functions *TOU2040*	Food Service Operations *TOU3030*	Food
The Accommodation Sector *TOU1050*	Meetings & Conferences *TOU2050*	Hotel/Motel Operations *TOU3040* Alternative Accommodations *TOU3050*	Accommodation
The Travel Sector *TOU1060*	Tourism Destinations 1 *TOU2060* Tourism Destinations 2 *TOU2070* Travel Planning *TOU2080*	Travel Agency Operations *TOU3060* Reservations & Ticketing *TOU3070* Air Transportation *TOU3080* Surface Transportation *TOU3090*	Travel
The Attractions Sector *TOU1070*	Tourism Interpretation 1 *TOU2090* Tourism Interpretation 2 *TOU2100*	Attractions Operations *TOU3100* Adventure & Ecotourism *TOU3110*	Attractions

—— Prerequisite

- - - - Recommended sequence

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 9:

STRATEGIES FOR INSTRUCTION

August 1997 (Interim)

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Purpose

Instructional strategies employed in CTS should develop basic and transferable career skills including managing learning and resources, problem solving and innovation, communicating effectively, and demonstrating responsibility. As well, students will develop a team work philosophy through a wide range of group and class activities, both of practical industry application and of a more general social and citizenship value.

The classroom environment should provide opportunities for students to experience and enhance these lifelong career competencies through a process or active learning approach.

Following are a wide range of instructional strategies that can be used for large group instruction, small group instruction and individual instruction.

CTS Team
August 1997

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A. LEARNING BY DOING/ACTIVE LEARNING

CTS emphasizes students "learning by doing." Essentially, the teacher's role is that of guide and partner in the learning process. This approach focuses substantially upon recognizing the different ways in which people learn, understanding this learning process and facilitating it. This approach involves the teacher expanding beyond that of a subject-based expert managing the learning process, and moving toward coaching the students to learn by doing and to discover and become responsible for their own learning. Active learning is the process of learning through doing and reflecting on the process. Active learning, where students are not just passive recipients of information but apply what they are learning, is the new paradigm.

The following concepts and activities support the CTS approach of "learning by doing."

Agenda – A list of things to be done, often prioritized. Ideally, the agenda is cooperatively developed and forms a meaningful basis for subsequent activity.

Action Plan – A plan indicating what needs to be done next. This is usually the output of a small group planning session related to some problem or opportunity and can be used to build on.

Formulation of an ACTION plan may be guided by such questions as:

- Where are we now?
- Where do we wish to go? (Time frame)
- How will we get there?
- What resources do we need?

"More effective results are generally achieved through purposeful pursuit than by chance."

Active Listening – An important interpersonal skill needed by both teacher and students. It demands high levels of concentration, devoting attention to the speaker, avoiding interrupting, being receptive, listening actively rather than just hearing, noting messages in the tone of voice, choice of words and nonverbal behaviour, checking understanding of what is being said, asking for clarification, elaboration and specific examples, and reserving judgement.

Atmosphere – If you are starting from scratch, it takes time to build the right atmosphere for active learning. The classroom climate should be friendly and nonthreatening. Group members need acceptance, trust and security so they can contribute freely, without teacher or other pressure or censure.

- Trust
- Openness
- Flexibility
- Mutual respect
- Ground rules

See "Positive Classroom Climate Checklist", page 8.

Catalyzing – Helping things happen. The odd casual question, or the curious "Why don't you try ...?" Helping to get the essence of a problem, as an interested peer, or encouraging a promising idea. Sometimes catalyzing involves playing devil's advocate, or gently nudging someone to actually do something rather than talking about it. The judicious imposition or negotiation of tight deadlines often injects some urgency into activities.

An activity may begin as a large group learning experience but extend into a small group and an individual activity.

Challenge – Sometimes active learning spills over to present a challenge to the status quo in other contexts, through students transferring their learning and practices: "Why can't we work on this in groups?" or "Why can't we do it this way?"

Compromise – The students and teacher can expect to compromise, not only through negotiation, but also because of organizational constraints. There will be some areas where there is no compromise (see **Ground Rules**).

Conflict – There may arise some conflict within a group during an activity, since the task often completely absorbs them. Resolution of the conflict should, as far as possible, be left to the group. Resolving conflict is a skill students should be encouraged to develop.

Compromise and conflict provide opportunities to develop increasingly important skills of:

- negotiation
- mediation.

Co-Op Co-Op (*Newsletter of the National Business Education Association*, Sept. 1994) **–** A main topic of study is selected and then subdivided into mini-topics. Each student selects a mini-topic, researches it, writes a paper, and shares the information with the small group. Students are encouraged to edit each other's work. After discussion, the information is compiled into a group presentation and shared with the entire class. The evaluation covers the individual papers and the student's work in the group.

Debriefing – This process follows an activity and is intended to draw out or reinforce the learning. Debriefing can be done within small groups prompted by a few key questions, and then for the whole class. It can be aided by having "process observers" who report back. It can be verbal or visual, it need not be "serious," and it can be individual.

Suggestions for a Debriefing Sessions

- Change the room/furniture at the end of the activity.
- Break into smaller groups to allow everyone an opportunity to share their feelings.
- Include time for debriefing when you plan the activity.
- Refer to titles rather than personal names in discussion.
- Ask open-ended questions.
- Analyze the behaviour observed and its causes.
- Conclude generally with a summary of the activity, the skills/knowledge involved, the process observed.

Careful planning and structuring by the teacher can enable key questions to be addressed concerning the process, the learning and the students' concerns. The debriefing process should not be left out and should not be rushed through. Allow sufficient time to reflect on what has happened and what students have learned.

Disclosure – Act of giving a piece of personal information to someone else. Helps in building trust. Encourages openness about feelings. Can be structured into activities, but needs to be handled sensitively, with absolute discretion in an atmosphere of trust and confidentiality.

Discussion – Very important in active learning. It can be spontaneous and associated with the task, or structured as the task itself, or to follow a task. It can be in twos, threes, small groups or whole class. The essence of active learning is that students do things and talk about what they have done or are doing. The teacher should ideally say the least during a discussion. Try to involve everyone, do not let one person dominate and be flexible while trying to cover the key areas.

Empathizing – The interpersonal skill of being able to understand the feelings or motives of others.

Excitement – It is common for students to get excited when involved in a task, particularly if in competition with others. Active learning, and especially simulations, have an emotional dimension to them. This can lead to lots of noise and laughter, which can be misinterpreted by other staff members. If you can, invite them in — not to observe, but to participate.

Expertise – The kinds of expertise or skills needed to implement active learning strategies include the abilities to devise, design and structure activities; monitor and facilitate the process of group dynamics; empathize; counsel and actively listen; demonstrate flexibility and creativity when responding and negotiating; plan and execute debriefing.

Discussion Contributions:

- volunteered information
- contributed an idea
- hitchhiked on another's idea
- questioned another's idea
- related specific examples to support thinking
- posed relevant questions
- asked for justification
- asked for clarification
- showed a willingness to be questioned
- listened without interruption
- considered facts before reaching conclusions
- showed respect for others.

Facilitator – The person responsible for the group working together. The role of the facilitator is to enable the group to make progress. Techniques to make this possible are part of the experience of a good facilitator. The art of using an "icebreaker" to help a new group to get to know each other; or recognizing a "red herring," which might deflect the energies of the groups from the real task; knowing when to summarize the progress so far in order to focus the group on the way forward — these are "facilitating" strategies. It is important that a facilitator is constantly alert to the needs of the group, and responds whenever and wherever appropriate, without becoming dominant or dictatorial.

Ground Rules – An explicit, negotiated and accepted code of expectations. Ideally, upheld through peer group pressure. Content is negotiated but might cover such things as safety, attendance, respect for others.

Group Dynamics – The social processes that groups go through over time in different circumstances. It is very important to have an understanding of how people function in small group contexts, and how different situations can be identified/anticipated and exploited/averted.

Grouping – There is a special skill in choosing or negotiating how may small groups there will be and the composition of each group.

Facilitation Techniques:
- be organized
- practise what you preach
- treat participants with respect
- ask ... don't tell
- be a coach ... provide encouragement and support
- start and finish on time
- be yourself
- monitor progress and respond appropriately.

Ground Rules - Sample:
- We respect the rights of others in the class and in the group.
- We never laugh at other people's mistakes
- We are free to make mistakes, and we learn from and through our mistakes.
- We share resources, materials and ideas.
- We always help a person in the group if he or she asks for help.
- We listen to what others have to say and ask questions if necessary.
- We praise the efforts of others.
- We take turns, do our share and do our best.
- We avoid asking the teacher a question unless we have asked others in our group. (ASK THREE BEFORE ME.)

Icebreaker – An activity that facilitates a group of individuals to feel comfortable together, especially with a new group, characterized by a lot of mixing and laughter. Sometimes called a "warm up," it can also be used to revive a sluggish class.

Idea Ownership – The pride felt by a student or group for an idea that they, themselves, have generated. Encourages psychological commitment by the individual or group.

Interpersonal Skills – Active learning demands the employment of interpersonal skills and, indeed, activities can be exclusively aimed at their development. Some interpersonal "skills" that are important in active learning are empathizing, assertiveness, active learning, self-confidence, self-awareness, building trust, leadership, negotiation and nonverbal communication.

Laughter – This is much more common and genuine in active learning situations. It signals enjoyment, group cohesion or relief. It tends to add to the noise level.

Learning Opportunities – Natural intervention points where the teacher can reinforce, elaborate or explore with an individual, a small group or the whole class, some aspect arising from the task at hand. Has spontaneity and relevance, lacks artificiality. It may not need the teacher. An active learning approach is to carefully structure a series of activities/experiences during which many learning opportunities will occur—some of them broadly predictable, others not. Teachers and students need to be flexible and opportunistic.

Motivation – Students cannot be coerced into active learning. It relies to a great extent on their wanting to do it. Reasons why they actually do participate include idea ownership, choice, responsibility, team spirit, group loyalty, interest, and because "it's different from normal lessons." This underlines the importance of building on their interests, enabling them the opportunity to work in groups and giving them ownership and responsibility for their learning.

Icebreaker Activities

- **Sibling Search** - divide into groups according to their place in the family (i.e., oldest, youngest, only child) and share what they liked or disliked about their respective place in the family
- **Jigsaw Puzzle** - cut up a picture and randomly distribute the pieces. Individuals then must search for the remaining parts. Note: The pictures selected could introduce a topic for discussion.
- **Autograph Sheet** - set up like a bingo score card with a descriptor in each box.

Negotiation – Reaching mutually acceptable agreement on matters like what to do next, how to do it, how much time is available, what would be a successful outcome, who to do it with. Negotiation occurs between teachers and students and among the students themselves. It is improved with practice.

Network – A network is a cluster of like-minded people who share a common interest or need. It operates as a self-help group. Its members communicate openly and freely to share their knowledge and expertise. A network may include those who are paid specifically for what they contribute most often.

Observer – A person who volunteers to observe a group absorbed in a task, and then report back on the process the group went through. Usually aided by a written brief or checklist, this is particularly useful in debriefing simulations (see **Process Observer**).

Process Observer – The activities within a group are the result of interaction between individuals and may be noted for future discussion by a group observer who focuses on that interaction and its consequences. In observing the group processes, an attempt is made to identify the methods used by a group to achieve its goals. Feedback from process observation allows a group to examine the way it is working, and to explore ways of improving the strategies used to achieve its goals.

Project – The activity through which students become involved. It may range from pair work through small group work to whole group activity. The activity might be preplanned or emerge from negotiation. All groups might be doing the same thing, or there might be a variety of tasks being pursued. Activity can be individual, but much of the educational value emerges through talking about it. Activity is when the students feel they are doing something rather than feeling something is being done to them.

Building a Support Network
Teachers are encouraged to establish local support networks to help meet the needs of the students. For example:

- In-school support networks could include school counsellors, administrators, teacher-librarians, other teachers, office managers.
- Community-based support networks could include parents, local business/industry, community representatives.

Suggested Brief for a Process Observer

- How did the group begin the task?
- Was a leader appointed? If so, by whom?
- Was a method of appointment used? If not, did a leader emerge?
- How were decisions reached? (If none, why not?)
- Was there negotiation? Confrontation? Cooperation?
- Consensus? Majority rule?
- Who spoke most? Least?
- Was any ignored? Omitted?

Reflecting – The process of looking back over the recently experienced activity, or part of an activity, to draw out/reinforce the learning. It can be solitary or in a group, structured or unstructured, immediate or eventual.

Role Play – A situation (sometimes briefed, sometimes loose, sometimes issue-focused, sometimes open) that enables students to develop empathy, negotiating skills, active learning and self-confidence.

Seating – It is unlikely that rows of desks are appropriate for active learning. Alternatives include a circle, small circles, a horseshoe, pairs facing each other, workstations. Sometimes a task is desirable inside a circle. Ideally, a room will have sufficient space to allow flexible seating arrangements.

Sensitivity – Sensitivity to individuals and groups through process observation, active listening and empathizing is much more necessary with active learning than in conventional teaching.

Simulation – A structured learning experience that emulates a real situation by designing in key features, processes and operating procedures. It can vary in length, complexity, flexibility and numbers being catered to. The participants' achievements in a simulation are influenced by predetermined key criteria. Some degree of role playing is generally necessary. Emphasis may by toward process or toward content.

Teaching Style – In active learning the teacher's role is not that of an autocratic expert, but rather one of guide, facilitator, mentor, catalyst, friend, collaborator. This demands a style that is democratic, highly participative, friendly, open and relaxed.

Starters for Reflection:

- Before I began this module ...
- Some discoveries that I make ...
- My work in this module was made easier because I ...
- In this module I had difficulty
- with ... because I ...
- One thing I would do differently next time ...
- I wonder if I will ever be able to...
- The part of this module that was most worthwhile to me was ...
- I would like to learn more about ...
- Now that I can ... I will be able to ...

POSITIVE CLASSROOM CLIMATE CHECKLIST

These classroom management strategies may be used as a basis of planning for positive classroom climate.

- ☐ Did I greet my students warmly?
- ☐ Are the students aware of the objective for today's activities?
- ☐ Did I help focus the class or individuals on today's activities?
- ☐ Did I review the major concepts from the previous session?
- ☐ Did I explain the purpose of today's lesson or activity clearly and accurately?
- ☐ Did I ask processing questions throughout today's lesson to check for understanding?
- ☐ Did I take five minutes at the end of the class period to allow students to summarize today's learnings?
- ☐ Did I respond to their assigned work in verbal or written form?
- ☐ Did I model all of the classroom ground rules on my own behaviour?
- ☐ Did I consistently enforce the ground rules?
- ☐ Did I consciously try to support the students by focusing on their positive qualities and praising their efforts?
- ☐ Did I handle problems quickly and discreetly, treating my students with respect and fairness?
- ☐ Am I creating a safe, supportive environment in which my students may grow and learn?
- ☐ Am I emphasizing the "specialness" of each individual student, the group as a whole, and the course itself?
- ☐ Am I genuinely encouraging parent and community involvement?

B. TEAMWORK/COOPERATIVE LEARNING

The ability to work as part of a team is essential in the workplace. The rapid changes in technology and the increase of information available encourages people to pool their expertise. This trend can be expected to become a crucial factor in the future. CTS offers an excellent opportunity for students to work in a team setting, either formally (preset teams) or informally (peer tutoring as needed or advantage arises).

There are many advantages in having students helping each other. First, they mutually enhance their communication skills. Second, they tend to generate more ideas than could be generated by each individual working separately. Third, the teacher has more time to deal with major issues and to facilitate the work of the teams.

GROUP LEARNING[1]

Group learning is a good way to promote active learning and encourage individual and group enterprise. Small group learning increases flexibility and helps students adopt more independent and responsible learning methods and become more self-disciplined. With small groups, students can become active participants in the classroom, and more motivated to achieve. The purpose of small group learning is to share information, solve problems, make decisions or help each other learn content or processes.

Cooperative learning groups are both an academic support system and a personal support system. Group members help, support and encourage one another to learn. As they do this they acquire many of the leadership, decision-making, trust-building, and conflict-management skills needed for teamwork.

When ready to implement cooperative learning, be sure to get the support of the administration, students, parents and other teachers.

Kinds of Groups

Depending on what is to be done—what the topic or task is for the students—there are different types and sizes of groups that can be used.

Effectively Working Together Involves:

- respect for self
- respect for others
- ability to empathize with others
- leadership and group-working skills
- interdependence: the ability to benefit from others' and a commitment to contribute for the benefit of the rest of the group.

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[1] Pages 9–15 have been adapted from *Project Real World,* Federal/Provincial Consumer Education and Plain Language Task Force, 1991. Used with permission.

Discussion Group

- A discussion group encourages students to become involved with their peers. It recognizes the importance of being able to work with others.
- The teacher must provide students with sufficient background information for the discussion of a clear understanding of the objectives.
- This is a good way to handle classroom, community or national issues.

Brainstorming Group

- Brainstorming is a fun way to encourage creative thinking and problem solving.
- It stimulates an individual student's participation and is nonthreatening, so it can draw out shy students.
- Students, in a set time, are asked to come up with as many ideas or suggestions on a topic as they can.
- Quantity of ideas is desired, freewheeling is effective and "hitchhiking" on their group or individual ideas is permitted.
- Judgement is deferred until the end, and criticism is not allowed.
- This is a good way to introduce students to other small group work.

Buzz Group

- Small clusters (four to seven students) are grouped for a short time (five to ten minutes) to seek the solution to an issue or problem.
- A recorder and leader are chosen quickly in each group.
- Alternatives to the issue are sought. The pros and cons of these are considered, agreement is sought, and one of several correct alternatives is selected.
- Teachers can use buzz groups on many occasions in the classroom. For example, when an issue is raised during a lesson, you can announce a buzz group session to explore it.

Tips for Using Groups

- Use groups of four to eight students.
- Provide space with proper furniture and good acoustics.
- Make sure that group *leaders* fully understand their role.
- Make sure that group *members* fully understands their role.
- Brief the students to clarify: WHAT will happen, WHY the activity is being done, WHEN it must be completed, and HOW to proceed.
- The topic should stimulate thinking and help students realize that any number of "correct answers" and a variety of legitimate viewpoints can exist.
- Give students clear objectives. What is the purpose? (You may wish to have students define the objectives.)
- The classroom climate should be friendly and non-threatening. Group members need acceptance, trust and security so that they can contribute freely, without teacher or other censure.

Think-Pair-Share Group (Lyman, 1985)

- This method extends students' thinking and interaction.
- The teacher begins with a short presentation on the topic. To encourage students to consider more fully what was explained, the teacher poses one question and asks students to spend a minute or two alone thinking about the issue.
- Students are then assigned in pairs to share what they were thinking. One student makes a statement, and the other must paraphrase it until the position of the student who made the original statement is clearly understood. This is followed by a reversal of the statement-maker and paraphraser roles.
- Students (pairs) then report back to the whole group or other pairs.

Problem-Solving Group

- Group members, in a systematic way, seek the solution to a problem.
- Problem-solving groups are based on the "Scientific Method." The steps are:
  - ◊ problem definition
  - ◊ brainstorm the likely causes of the problem
  - ◊ decide the most likely cause
  - ◊ brainstorm potential solutions
  - ◊ select the most likely solution (based on determination of pros and cons of alternatives)
  - ◊ decide when and how to implement the solution.

Tutorial Group

- Tutorial groups are set up to assist students who need help or additional practice, or for students who can benefit from enrichment.
- A tutorial group is led by the teacher or by a student.
- Greater attention to individual needs is possible, and students can participate more actively when tutorial groups are used

The Teacher's Role in Group Learning

- Communicate objectives, select the topic or assignment, and ensure the task is understood.
- Decide the size of the groups.
- Assign the students to groups.
- See that the room is arranged to accommodate group work.
- Provide appropriate materials.
- Set the time for completion of the task.
- Inform the group of the behaviour expected, and teach interpersonal and group skills.
- Act as a resource person and monitor.
- Intervene, as necessary, to solve problems or to teach group skills
- See that group effectiveness is monitored.
- Evaluate the product of the group and the individuals in it.

"Learning Buddies" is a technique to get students used to working together. Students develop a group of buddies to meet with to discuss and/or review information.

Laboratory Group/Investigative Group

- A laboratory group is formed to complete a project, do an experiment, or practise something that has been presented by the teacher.
- A common example is a food laboratory group.

Role-playing Group

- In a role-playing group, each group member is assigned a role to assume on a controversial topic.
- Students may or may not agree with the stance they have been given to present or defend.
- A role-playing group can bring out all sides of an issue, or help students learn to understand the ideas or feelings of others.

One–Three–Six Group

- The one–three–six group method can be used at almost any time during a lesson.
- Students are asked, as individuals, to record their opinion on an issue. Then each student is asked to join two other students (form groups of three) and come to an agreement.
- Two groups of three join and seek consensus.

Panel, Committee, Symposium, Forum, Dialogue and Round Table

- Rather than the teacher presenting information on ideas through lectures, assigned questions or readings, students can play an active part in their learning.
- This can be done by setting up a:
  - **panel:** a group of students discuss a topic before the class—chaired by either the teacher or a student
  - **committee:** a group of students learn about a topic and report
  - **symposium:** several students become "experts" in a topic, and give brief presentations to the class

The Students' Role in Small Groups (Stanford and Rourke, 1974)

- **Initiator** – gets discussion underway, helps the group organize and keeps it moving toward the goal.
- **Contributor** – offers opinions, facts, anecdotes, or examples that could help the group solve the problem.
- **Clarifier** – helps make sure that the terms, the problem and contributions by group members are understood by all. If needed, the clarifier suggests that added information be sought.
- **Summarizer** – helps keep discussion relevant and to the point by bringing together and summarizing what has been discussed or learned to date. The summarizer also makes sure that everybody in the group. understands where the group stands on an issue.
- **Evaluator** – keeps track of how well the group is progressing in its task and tactfully points out problems the group is having in working together.
- **Encourager** – facilitates participation by listening carefully, being friendly, complimenting members for their contributions and inviting participation.
- **Harmonizer** – is the peacekeeper, the "one who throws oil on troubled waters" by relieving tension (perhaps through humour), settling disputes, helping the group work out disagreements and suggesting compromises.

- ◊ **forum:** a class discussion in which a problem is explored through questions and answers and short statements, under the guidance of a chairperson
- ◊ **dialogue:** two people discuss a topic in front of the class
- ◊ **round table:** a group of students discuss a specific topic or issue for a set length of time (approximately 10 - 15 minutes). A moderator and/or recorder may be identified to focus and/or summarize discussion.
- ◊ **round robin:** students take turns stating answers orally in the small group and then share the test with the entire class.

- ♦ Students find these methods motivating. The teacher can provide a summary to ensure that content is organized, correctly understood and that it links to what is being studied.

Assessing Small Group Effectiveness

You can tell if a group is doing well. The climate is positive, people are on task and seem to be enjoying themselves. Everybody seems involved and discussion does not "drag."

You can assess how well a group is doing by asking key questions. These can form the basis for making the group more effective. You can ask yourself why a particular pattern or behaviour occurs, and what you can do about it (see **Group Member Effectiveness Observational Form**, page 16).

Advantages of Using Groups

- Increased resources
- Members are often stimulated by others
- Better decisions can result
- Group members may have a stronger commitment
- Students are more actively involved
- Personal and social learning take place
- Peer teaching is advantageous
- Learning may be deepened

Limitations of Using Groups

- Group decision making takes time
- Time may be seen to be wasted
- Convictions may be suppressed
- Some tasks are better done by individuals
- Talk may be substituted for action

CHARACTERISTICS OF EFFECTIVE GROUP MEMBERS

TEAM MEMBERS ARE TO:

☐ be on time and attend all group sessions

☐ take an active part, and contribute information and ideas

☐ contribute to group maintenance

☐ have a positive, rather than negative or critical, approach

☐ listen when others speak, be empathetic and hear others out

☐ respect and interact with other members

☐ respect individual differences

☐ avoid prejudice and keep biases out

☐ seek, and be open to, the ideas and suggestions of others

☐ encourage non-contributors to take part

☐ accept responsibility for the consequences of their behaviour

☐ be sensitive to the feelings and concerns of others

☐ avoid self-serving, judgemental, blaming, grandstanding or storytelling behaviour

☐ be genuine and open

☐ support others, and help them articulate their ideas

☐ help the group by summarizing, clarifying, mediating, praising and encouraging

☐ use problem-solving, decision-making and conflict resolution frames of reference

☐ act as group leader, recorder or group effectiveness monitor, as appropriate.

Characteristics of Effective Group Members, continued

GROUP LEADERS ARE TO:

☐ see that the "problem" is clarified
☐ get discussion started
☐ keep discussion moving
☐ see that all phases of the problem are brought out
☐ keep discussion on topic
☐ encourage full participation and draw out "non-talkers"
☐ be objective
☐ rephrase, clarify statements, or have others do this
☐ see that summaries or conclusions are made
☐ see that all members are treated with respect
☐ respect the confidence of the group
☐ report, or see that the thoughts of the group are fairly reported.

PARTICIPANTS ARE TO:

☐ contribute a reasonable quantity of ideas and experiences
☐ keep prejudices out (at the very least, recognize them as such)
☐ keep on topic
☐ avoid "storytelling" and engaging in long, drawn-out arguments
☐ avoid making speeches to show off
☐ help phrase ideas and statements
☐ show respect for their ideas and opinions of others
☐ confine the argument to ideas and not engage in personal attacks
☐ help make summaries and reach a conclusion
☐ act as recorder or discussion evaluator as assigned.

GROUP MEMBER EFFECTIVENESS OBSERVATION FORM E&IGRP

Name: ______________________

Date: ______________________

Observations: **4** = Always; **3** = Frequently; **2** = Occasionally; **1** = Never

Project: ______________________ **Group:** ______________________	**Observations**			
Standard	**4**	**3**	**2**	**1**
was on time	☐	☐	☐	☐
attended group sessions	☐	☐	☐	☐
took an active part and contributed information and ideas	☐	☐	☐	☐
had a positive, rather than negative or critical, approach	☐	☐	☐	☐
listened when others spoke	☐	☐	☐	☐
respected and interacted with other members	☐	☐	☐	☐
respected individual differences	☐	☐	☐	☐
avoided prejudice and kept biases out	☐	☐	☐	☐
was open to the ideas and suggestions of others	☐	☐	☐	☐
encouraged non-contributors to take part	☐	☐	☐	☐
accepted responsibility for the consequences of his/her behaviour	☐	☐	☐	☐
was sensitive to the feelings and concerns of others	☐	☐	☐	☐
was genuine and open	☐	☐	☐	☐
supported others and helped them articulate their ideas	☐	☐	☐	☐
helped the group by summarizing, clarifying, mediating, praising and encouraging	☐	☐	☐	☐
Strategies for Improvement				

C. MULTI-ACTIVITY LEARNING

Multi-activity learning is a strategy that effectively involves the student in the management process in order that he or she will have the ability to adapt to the challenges of change with increased flexibility and confidence.

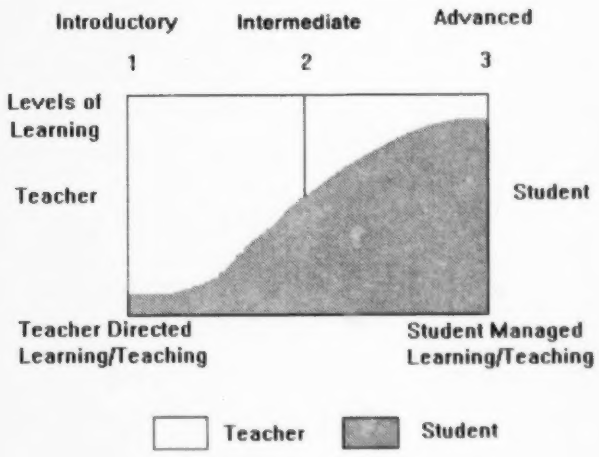
Multi-activity learning is a process of teaching and learning that focuses on the applied skills of management, communication and problem solving/decision making. It is student centered, involving student-directed and teacher-directed learning, which can be combined and applied into a multi-activity, multi-module program. Student-centered learning is process based to teach content and skills through "hands-on" learning activities. It should motivate the student to become a self-directed lifelong learner who is adaptable to change.

The CTS program empowers the students, as individuals or in groups, to work on completing a module within a specified time. By making decisions and solving "real-life" problems, they learn to manage time, energy, equipment, money, information, audiovisual resources and people. Students are encouraged to take ownership for their learning and be proud of their accomplishments.

CTS is a program that benefits both the teacher and the student. It combines the concepts of cooperative learning, peer teaching and group processes applied through management, communication and decision making. The role of the teacher is to be the motivator, facilitator and evaluator of learning, as well as the designer and developer of learning activities.

Although the program allows more freedom and choice to the student, it is a highly structured program. Multi-activity learning involves much structure and planning previous to implementation, and class time spent in orienting the student to managing of their own learning.

Managing Multi-Activity Learning



If students are perceived as capable and are expected to manage their own learning, they will accomplish it. The teacher can then spend time on instructional matters instead of spending time on "managing" the students. As the student progresses from the introductory level to the advanced levels, a larger number of activity choices may be introduced along with a greater amount of time in which to plan.

Students learn to allocate their time resources realistically and thereby insure that their obligations are met within these time limits. Students generally are responsible for scheduling their time to complete all the tasks assigned by the teacher and some additional learning activities of their own choice within the given amount of time. They may work on these tasks in any order they choose during the specified time period. Time may be set aside by the teacher for other large group activities, sharing of information, guest speakers, or special events. With new technology in the home and in the classroom, the management process becomes more important as the teacher takes on the role of facilitator of instruction rather than provider of knowledge. Students take on the role of actively managing their own learning.

The following planning charts (one month, three month, and yearly) may be useful in coordinating multi-activity labs. A sample "contract" is included and may be used to clarify learning expectations for each module.

ONE MONTH TIME PLAN

MONTH ____________ **YEAR** __________

MON	**TUE**	**WED**	**THURS**	**FRI**

THREE MONTH TIME PLAN

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY

TEACHER AND STUDENT
Yearly Time Plan and Scope and Sequence

19___

	M	T	W	T	F
S					
E					
P					
T					

	M	T	W	T	F
O					
C					
T					

	M	T	W	T	F
N					
O					
V					

	M	T	W	T	F
D					
E					
C					

	M	T	W	T	F
J					
A					
N					

	M	T	W	T	F
F					
E					
B					

	M	T	W	T	F
M					
A					
R					

	M	T	W	T	F
A					
P					
R					

	M	T	W	T	F
M					
A					
Y					

	M	T	W	T	F
J					
U					
N					
E					

CONTRACT

An agreement between a student and a teacher can be used to focus a student's attention on class expectations. This example could be altered as necessary.

Student________________________________ Date ________________

Course or module name____________________ Teacher ______________

LEARNER EXPECTATIONS (of module)

1. ____
2. ____
3. ____
4. ____

ASSIGNMENTS TO BE SUCCESSFULLY COMPLETED (in order to finish the course or module)

1. ____
2. ____
3. ____
4. ____

PERFORMANCE INDICATORS (list specific behaviours necessary for successful completion of the course or module)

1. ____
2. ____
3. ____
4. ____

I understand the requirements for the course or module, and I will meet the requirements necessary to complete the module or course.

________________	________________	________________
Date	Signature of Student	Witnessed by Parent(s) or Guardian

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 10:

Developing Facilities To Support Career and Technology Studies

August 1997 (Interim)

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A. PRINCIPLES IN FACILITY PLANNING FOR CTS

1. Decide what strands and modules will be offered by or in the school.
2. Close proximity of related instructional areas.
3. Public health restrictions in relation to Foods, Cosmetology Studies and Community Health.
4. Safety concerns: space, fume extraction, dust extraction.
5. Teacher is facilitator.
6. Learning centres where students work alone or in small groups.
7. Number of student workstations relates to the number of students in the class and percentage use of the equipment.
8. Planning space for multifunctions. The space needs to be flexible and adaptable to different uses.
9. Complete visibility for the teacher of all areas of the CTS suite.
10. Ceiling lights compatible with computer monitors.

B. GENERAL GUIDELINES FOR CTS SUITES

The improvement of CTS facilities is not an easy project! It may involve years of planning, renovation and follow-up. Thousands of dollars may be spent before the first piece of equipment is moved. But the end result, an efficient CTS suite setting, is a desirable goal and well worth the efforts.

It is expected that the needs for specialized classrooms and suites for CTS programs will continue. However, as student learning and instruction becomes more PERSONALIZED these facilities will likely become less specialized to meet a wider range of student and community needs.

This section outlines suggestions for key elements of the total design. The items discussed include:

- considerations for instructional areas
- recommendations for the physical environment
- recommendations for services.

1. CONSIDERATIONS FOR INSTRUCTIONAL AREAS

GENERAL LOCATION

Career and Technology Studies suites should be located in the ground level because of the weight and vibration of the equipment and for community access. Also, it will be easier to get materials in and out the facilities. An area for student seating and group work is suggested within the suite or nearby.

SHAPE OF CLASSROOM AND CTS AREAS

Both the CTS suite and resource room areas should be available for instructional purposes without partitions or other barriers. This will allow the teacher full visibility of the entire facility. In addition, narrow CTS suite designs should be avoided and contours eliminated which limit the view of students completing assignments, using the equipment, etc. If at all possible, have all strand areas interconnected, allowing for student movement between areas.

Increasingly, the partitions of the school will be removed; spaces will become larger and more flexible. These spaces will be loosely subdivided into workstations, research centres, computer centres, clean spaces and seminar rooms. Such spaces will allow for a series of quite different activities for individuals, small and large groups of students across a broad range of modules.

STUDENT SEATING/RESOURCE ROOM (INSTRUCTIONAL AREA)

Each student should have an individual desk or seat at a table/bench. A chalkboard or whiteboard is recommended for the resource room. In addition, provision should be made for projecting images (from TV/VCR units, projectors, laser disk players, etc.) as part of the room.

STORAGE

Storage must comply with building code standards. For instance, vertical racks are usually recommended for storing long or sheet materials. But for safety reasons, large quantities of wood and metal should be stored on low, level horizontal racks. Cabinets should provide for storage of supplies and open shelving (minimum 60 cm deep) should be provided on one side of the materials storeroom. Provisions must be made for shipping and receiving supplies and materials. Shelving for storing student materials should also be provided. Try to avoid mezzanines for student project storage. Fire approved metal cabinets are required for storing paints and other inflammable material. Locked storage, with one key (for student work in progress) should also be provided in certain laboratories. Storage should also be provided for resource materials such as software, robotic arms, lasers, video materials, etc.

2. RECOMMENDATIONS FOR THE PHYSICAL ENVIRONMENT

FLOORS

Floor covering appropriate to the nature of the activity is recommended. For example, carpeting is recommended in planning and design areas, resilient tile or hardwood floors for general work areas, surface treated concrete where grit, oil or water are present, and sand floors or possible steel grating for foundry areas (not concrete).

WALLS

The lower portion of walls should be free from obstructions and projections to allow efficient placement of benches, machines and cabinets. Moveable walls or screens are recommended for some activities that could be hazardous or distracting to students not actively involved in the project. Lights reflecting paint colours should be used with "scrubbable" surfaces provided around points of wear, water or oil use. The term "scrubbable" implies a glazed, non-porous surface, such as produced by epoxy paint or ceramic tile, as necessary. Sound-absorbing materials should surround instructional areas.

DOORS

All doors must swing out, and each suite be equipped with two exit doors. Doors shall also be provided to allow access to each suite for the purpose of moving equipment, supplies and large projects. A double door without a centre post or with a removable post will serve this purpose and can also serve as another means for student exit. The principles of flexibility and curriculum change must be considered in the selection and placement of doors.

WINDOWS

The use of windows in certain areas will provide an open atmosphere to the facility. Also, natural lighting may be appropriate in design areas. Glass should be provided between connecting CTS suites to ensure good visibility of all students. This will provide a dust-free environment for certain pieces of equipment.

CEILING

Ceiling height should be no less that 2.5 metres and higher if additional space is needed. These distances should be the clearance below light fixtures. Also, materials with high sound-absorption characteristics and light-reflective qualities are recommended.

LIGHTING

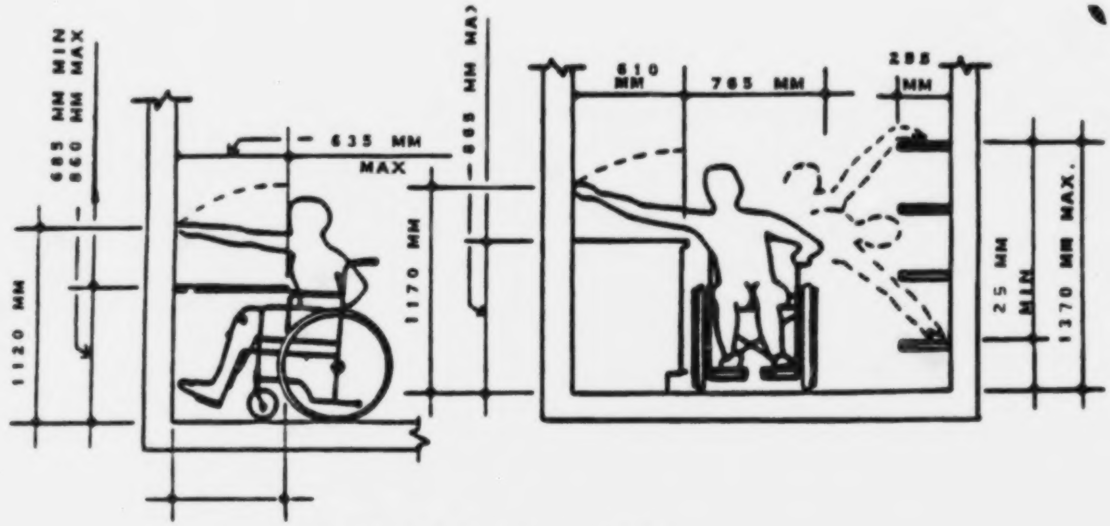
The Illuminating Engineering Society (in the United States of America) recommends the following standards (reported in "foot candles" for these activities and areas):

70fc –	Classrooms, proofreading, general assembly, testing, inspection
100fc –	Drawing, general assembly, testing, counter displays
150fc –	Detail drawing, fine assembly, inspection, display lighting, severe and prolonged seeing tasks, office tasks.

The computer area should have indirect lighting and/or pancube light lenses.

ACCESSIBILITY

Modern public facilities must provide for routine access for all students and visitors. Therefore, the renovation of CTS-based areas may involve increasing the width of aisle ways, altering entrances and similar efforts for equal access. Consult your local officials for up-to-date community and provincial standard (NOTE: sample guidelines are shown below).



Standards for Storage Units

MACHINES

A minimum number of machines should be permanently located (NOTE: This may depend upon local restrictions). Areas for strands such as Fabrication Studies, Mechanics and Construction Technologies may have heavy machinery that should be permanently mounted on vibration pads. Computers should be networked as necessary with point-to-point connections. As much as possible, CTS equipment should be of the size and type to allow for flexibility in configuration and provide a safe working space around and between machines.

DISPLAY CASES

Display cases, equipped with lockable doors and indirect lighting, should be located near the CTS suites. If possible, a bulletin board or display case may be placed near the foyer or the department or building.

3. RECOMMENDATIONS FOR SERVICES

DUST COLLECTION

A ceiling-mounted flexible dust-collection system should serve machines such as the circular saw, radial area saw, lathes, bandsaw, jointer, shaper, sander and planer. The mechanical unit should be located outside the CTS suite. (NOTE: Local specification may require collectors for each machine.)

ELECTRICAL SERVICE

A master switch panel should be mounted in a convenient place within each suite. Each electrical circuit should have a circuit breaker. Remote control safety switches (emergency disconnects) should be located on each wall of the suite. Multiple 110-volt grounded outlets should be provided on all of the walls above benches or cabinets. Install as many outlets as feasible. Ceiling "bus bars" should be provided to service multiple equipment locations. Heavy duty service should be provided for kilns, welders, furnaces, etc. Install large cable trays/raceways for present and future networking, electrical, air, etc. All standards for electrical services and equipment MUST be followed!!

COMPRESSED AIR

Compressed air should be supplied (from a central source outside the suite) with outlets available in each room. Ensure air is properly conditioned for use in each strand.

PLUMBING (WATER)

A hand-washing and general-use sink should be located near the main entrance to each CTS area. A drinking fountain may be provided adjacent to or part of the sink. Many of the CTS strands may require water as part of their curriculum activities. Outside water bibs may be needed for construction activities, agriculture, mechanics, etc. (with a hook-up for garden hoses).

FUME EXHAUST

A hood to collect and remove smoke and related fumes should be installed over areas such as the plastics, foundry, kiln and welding sites. Avoid using a common duct for sparks and combustible fumes. In the transportation and manufacturing areas, provisions should be made to exhaust fumes from propulsion systems. Air exchange units should service areas where activities might involve cooking, hair perms, glues, abrasives and aerosol sprays. Locate all exhaust and compressor mechanical units outside of the instructional areas, preferable in a mechanical room or exterior location.

FIRE PROTECTION

Appropriate fire extinguishers and fire protection equipment of sufficient capacity shall be provided for each site. This equipment MUST be clearly marked for correct use.

TELEPHONE

A telephone is desirable in this area for such things as emergency situations, safety, constant supervision of students, ordering of materials, networking with community partners.

C. PROGRAMMING CHECKLIST

Planning for facilities is a collaborative process involving teachers, administrators, students and the community. Decisions regarding facilities and equipment are made on the basis of student need, knowledge of the curriculum, further education and workplace opportunities.

The checklist is designed to assist Career and Technology Studies educators in completing the needs assessment component of the procedure to develop a CTS suite. The checklist is composed of five sections. The first section concerns administrative information; the second section concerns identification of instructional recommendations; the third section guides the selection and acquisition of equipment and the determination of equipment specifications; the fourth section aids in the determination of structural requirements and identification of utility requirements; and the fifth section guides the identification and selection of laboratory and classroom furniture. A separate report should be prepared for each question, with the question listed at the top of the page. There may be more than one answer to each question. CTS teachers should attempt to answer all questions.

ADMINISTRATIVE INFORMATION

1. What is the allocated budget?
2. Who is responsible for project planning, management and completion?
3. Who is responsible for laboratory safety?
4. Who can authorize changes in design or engineering aspects?
5. Describe any specific requirements that may affect design or construction.
6. What safety requirements must be adhered to?
7. What are the security requirements?

Additional questions …

INSTRUCTIONAL RECOMMENDATIONS

1. What strands and modules will delivered? (On/off-campus) in the laboratory?
2. What are the audio-visual recommendations?
3. How many students will be enrolled in each module?
4. What will be taught simultaneously?
5. How many teachers will be involved in the program?
6. Which delivery strategies will be used?
7. Which approaches to teaching CTS will be used?
8. What types of instructional materials are recommended for laboratory instruction?
9. How much time is allocated for each class session?
10. What will be the duration of each completed strand?
11. What off-campus activities related to coursework will students be involved in?
12. What percentage of each module is taught in the classroom?
13. What percentage of each module is taught in the laboratory? (Off-Campus)
14. What are the general learner expectations of each strand?
15. What are the specific goals of each strand?
16. What are the safety hazards associated with instruction?
17. What are the anticipated curriculum needs:
    In two years?
    In five years?
    In ten years?

Additional questions …

IDENTIFICATION OF EQUIPMENT NEEDS AND EQUIPMENT SPECIFICATIONS

1. What instructional equipment is recommended for teaching each of the strands identified in section one?
2. What CTD equipment is recommended for teaching each of the strands identified in section one?
3. Which piece of equipment can be used to teach more than one strand?
4. How many pieces of each type of equipment are recommended to teach each strand
5. How many students will be able to use each piece of during each class period?
6. What are the laboratory equipment specifications?
7. What are the instructional equipment specifications?
8. How will the equipment be acquired?
9. What are the specific safety hazards associated with each piece of equipment?

Additional Questions . . .

IDENTIFICATION OF STRUCTURAL REQUIREMENTS AND UTILITY REQUIREMENTS

1. How many CTS suites will be recommended?
2. What types of CTS suites are recommended?
3. What are the access requirements?
4. Which utilities are required for each of the pieces of equipment identified in section two?
5. What are the heating loads?
6. What are the cooling loads?
7. What are the electrical requirements?
8. What ventilation are the requirements?
9. The walls should be composed of what materials?
10. The floors should be composed of what materials?
11. From what materials should the ceilings be made?
12. From what materials should the utility lines be made?
13. What specialized rooms are recommended?
14. What are the coordination requirements affecting placement of utilities?
15. What are the specific needs among rooms, activities, and classes?
16. What utilities already exist in the facility if this is a renovation project?
17. What aesthetic consideration must be addressed?
18. What are the storage needs?
19. What are the administrative requirements?
20. What are the maintenance requirements?
21. What are the structural support requirements for utilization of specific equipment?
22. What are the potential noise problems that must be considered?
23. How much space is recommended for each resource area?
24. How much space is recommended for each piece of equipment?
25. How much space is recommended for each CTS suite?
26. What is the desired resource area floor plan arrangement?
27. What is the desired CTS suite floor plan arrangement?
28. What CSA certification requirements for tendering process are required?

Additional Questions . . .

D. PLANNING CHECKLIST

The following facilities planning checklist is designed to help plan facilities that will enhance teaching, learning and safety.

Determining Need	**Yes**	**No**
• Has a need assessment been completed?		
• Has achieving the learner outcomes been planned?		
• Can these outcomes be met within the existing school and resources?		
• Are there community resources that will meet these needs?		
• Will a facility modernization within the school meet the needs?		
• Is new space the recommendation?		

Developing the Concept	**Yes**	**No**
• Has there been input from the community, students, staff, business, industry, organizations, local government?		
• Have other districts and school been contacted?		
• Has there been discussion with local teachers, administrators and board members?		
• Has the project been discussed with outside consultants?		
• Are labs/workstations similar to those found in the occupations represented?		
• Is there a need for direct outside access for customer service and delivery of materials?		
• Has consideration been given to the relationship of spaces in and outside the facility?		
• Is there a logical arrangement for instruction and lab management with adequate areas for both group and individualized instruction?		
• Is there space for an instructor work centre?		
• Is an instructional resource centre available/appropriate?		
• Are there sufficient number of workstations?		
• Have opportunities for curriculum integration been discussed?		
• Has consideration been given for accessibility for all students including those with physical disabilities?		
• Is it a safe environment overall?		

Furnishings and Equipment	**Yes**	**No**
• Will modular furniture and cabinets be used?		
• Will modular units be mobile (where possible)?		
• Are the work surfaces and flooring appropriate for projected activities?		
• Are assembly, fabrication, preparation areas adequate/appropriate?		
• Are there sufficient white boards, bulletin boards, display boards and projection screens?		
• Is there space to display three-dimensional work?		
• Is there sufficient storage space for equipment, instructional materials, and supplies?		
• Is there locker space for all students?		
• Is there adequate utility connections (power, water, gas, etc.)?		

Furnishing and Equipment (continued)

	Yes	No
• Has make, model, accessories, space needs and power requirements of the equipment been identified?	______	______
• Are there provisions for exhaust, ventilation, acoustics and illumination?	______	______
• Are provisions made for use of multimedia (i.e., sound, light control)?	______	______
• Has a sketch been prepared to show the location of furnishings and equipment within the work centres (independent study or group work areas)?	______	______
• Are equipment and supplies adequate for the tasks identified for the program?	______	______
• Is there conformity to local, provincial and federal health and safety regulations?	______	______
• Is there sufficient space between workstations and equipment for a safe traffic flow pattern?	______	______
• Is it a safe environment overall?	______	______

Ambient Features

	Yes	No
• Does the colour scheme enhance the mental and physical well-being of the students and staff?	______	______
• Is there sufficient natural and full spectrum lighting?	______	______
• Are walls, ceiling and floor durable yet appealing?	______	______
• Are there areas for small group work?	______	______
• Are there quiet spaces for students to engage in reflective thinking?	______	______
• Is there a visible and "customer" friendly location for the community to contact the school?	______	______

E. FACILITIES CHECKLIST

The criteria in this checklist are generic rather than specific. Most will apply to every facility regardless of the curricular area being addressed. No attempt has been made to analyze the appropriateness of the interface between the curriculum and the facility. No consideration has been made for the compliance with provincial and local laws or building codes. This list is intended to be a guide for an evaluator who is knowledgeable about educational facilities; therefore, it does not include all factors affecting all laboratories. The interface between human and physical factors is considered. Flexibility and adaptability should be consistently considered.

General Location

1. Location in the main building
2. Location in relation to other CTS areas
3. Delivery access
    a. location
    b. size
4. Health considerations, e.g., food, cosmetology solutions, fumes.

Laboratory Space

1. Shape
2. Total floor area
3. Area per student square metre
4. Ceiling height
5. Aisles

Surface Treatment

1. Floors
    a. appropriate material for area
    b. condition
    c. colour
2. Walls and partitions
    a. appropriate materials for area
    b. condition
    c. colour
    d. acoustical material
3. Ceiling
    a. appropriate materials for area
    b. condition
    c. colour
    d. acoustical material

Doors

1. Student access/exit
    a. location
    b. size
2. Service access
    a. location
    b. size

Windows

1. Location
2. Size
3. Area
4. Height above floor
5. Control of natural light

Heating and Cooling

1. Size
2. Operation noise level
3. Control
4. Relative humidity
5. Air currents

Ventilation

1. Adequate
2. Control

Dust Control/Vacuum System

1. Air purification system
2. Specific machines and equipment

Illumination

1. General lighting
   a. artificial
      i. adequate
      ii. control
   b. natural
      i. adequate
      ii. control
2. Task lighting
   a. artificial
      i. adequate
      ii. control
   b. natural
      i. adequate
      ii. control

Electrical Service

1. General availability
   a. voltages
   b. amperage
   c. phases
2. Convenience outlets
   a. adequate

Other Utilities

1. Natural gas
   a. experiment benches
   b. demonstration bench
   c. specific equipment
2. Compressed air
3. Water
   a. personal washing
   b. drinking fountain
   c. utility sink
   d. specified machines
   e. specified areas – darkroom, etc.
4. Telephone
   a. jacks
   b. modem

Major Area Considerations

1. Instruction
   a. location
   b. size
   c. seating
   d. chalkboard/white boards
   e. overhead projector and screen
   f. television and VCR capability
   g. other mediated instruction capability
   h. displayboard
2. Instructor's area (office)
   a. size
   b. location
   c. privacy
3. Storage
   a. teaching materials
   b. student books, personal items, etc.
   c. student work (experiments, projects, activities)
   d. evening student work
   e. CTS materials/supplies
      i. active storage (small quantities)
      ii. inactive storage (large quantities)
   f. portable tools and equipment
4. Finishing area/room
   a. size
   b. lighting
   c. ventilation
5. Display areas
   a. central area of school
   b. corridor
   c. suite
6. Project/production assembly area
7. CTS library/resource area
   a. references, journals, textbooks, specification books
   b. television with VCR
   c. mediated instruction materials
   d. computer accessibility
   e. individualized instruction capacity
8. Computer area
   a. location
   b. clean environment

Visual Supervision

1. Ability to see all areas from any position in the suite

Equipment/Machines

1. Adequate to facilitate instruction
2. Appropriate for anticipated use
3. Meets physical needs of all students
4. Condition of maintenance
5. Logical placement
6. Safe operator area
7. Flexibility

Tools—Hand and Powered (electrical, pneumatic, etc.)

1. Appropriate
2. Quantity
3. Quality
4. Storage facility—panels, cabinets, etc.
5. Relationship of storage location to use area
6. Security
7. Flexibility

Workstations

1. Sufficient number
2. Appropriate types for CTS activities
3. Placement
4. Condition

Traffic Analysis (consider all physical needs of all students)

1. Aisle widths
2. Projections into aisles
3. Space between machines
4. Equipment placement for proper sequential use
5. Area-to-area
   a. corridor to instruction area
   b. instruction area to CTS work
   c. stations
   d. workstations to finishing area
6. CTS suite to CTS suite

Safety

1. Machine guards
2. Safety colour-coded equipment parts
3. Safety zones identified
4. Fire detectors
5. Fire extinguishers
6. Fire alarm system
7. Fireproof storage
8. Automatic sprinkler system
9. Safety glasses
10. First-aid kit
11. Waste storage
    a. flammable
    b. toxic
12. Consideration for students with special needs

Maintenance Schedule

as per policy and unit specifications

Restroom Facilities

as per building codes/plans

F. FACILITY IMPROVEMENT PLAN

The checklist below is a suggested approach for planning the implementation of new curriculum, equipment, etc.; the process of obtaining the new materials, tools, etc., and managing the total renovation effort. These eight major steps are listed in sequential order.

Identify Intended Outcome

1. specify desired strands to be offered
2. formalize scope of project
3. review external factors (political, economic, etc.)

Organize Advisory Team

4. identify members of Advisory Team
5. include all stakeholders
6. assess talents (strengths and weaknesses) of team
7. designate staff assignments and level of authority
8. establish communication plan

Specify Program Needs

9. confirm strands and modules to be offered
10. develop initial equipment, material and renovation (floor) plans
11. gain preliminary (informal) support

Establish Schedule of Conversion

12. identify key dates/deadlines for the project
13. establish timeline for planning and implementation efforts
14. confirm proposed agenda with school personnel, etc.

Complete Planning Phase

15. review existing equipment, materials, etc.
16. finalize new equipment and material plans
17. propose budgetary details
18. complete renovation plans
19. confirm plans with school and central office, administration, etc.
20. prepare documentation for formal presentations

Present Plans to Proper Authorities

21. seek support among advisory committee, principals, and others
22. explain developed plan to administration, school board, etc.
23. modify plans, schedules, budgets, etc., as necessary
24. gain formal approval

Implementation Period

25. convert program and facility as outlined
26. monitor/evaluate implementation efforts
27. adjust plans and specified changes as necessary

Follow-Up Efforts

28. invite school officials to review improvements
29. compare results to original plans
30. formalize safety plans and maintenance program
31. implement strategic program to continue development.

G. FACILITY DEVELOPMENT BUDGET WORKSHEET

Major Budgetary Items	Priority (High, Fair, Etc.)	Proposed Cost(s)
Professional (Staff) Development		
Training/In-Service		$
Meeting Expenses (Travel, Food)		$
Other		$
		$
Curriculum Development		
Strand Development		$
Printing (duplication costs)		$
Resources (media, texts, etc.)		$
Other		$
		$
Renovation Work		
Electrical/utility work		$
Cabinets, counters, etc.		$
Partitions, walls, doors, etc.		$
Classroom Areas		$
Other		$
		$
Equipment/Materials/Supplies		
Furniture		$
Audio-visual equipment		$
Computer hardware/software		$
Specific equipment		$
List:		$
		$
Maintenance Program		
Maintain laboratory equipment		$
Miscellaneous		
Match accessibility guidelines		$
Consulting		$

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 11:

Student Learning Guide Development Matrix and Directory

August 1997 (Interim)

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Every effort has been made to acknowledge original sources and comply with copyright regulations. Please notify Alberta Education if there are cases where this has not been done.

Purpose

The purpose of this document is to encourage the cooperative, efficient planning and development of student learning guides (SLGs) and the sharing of professional expertise and resources.

The goal is to assist those implementing CTS by providing a communication vehicle that may help reduce duplication of effort and will help build networks among teachers.

CTS Team
August 1997

Questions or comments about this *Manual for Administrators, Counsellors and Teachers* are welcomed and should be directed to:

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education,
Devonian Building West, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.
Telephone: 403–422–4872*, Fax: 403–422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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Section I

Background

Many excellent student learning guides (SLGs) are being developed around the province. Although Alberta Education has developed a template and some samples, the bulk of development is being done by individuals and organizations such as school jurisdictions and specialist councils.

The SLG developers listed in this document form an informal consortium. Some developers have SLGs in the works, but the final product is not ready yet. The formats and methods of sharing/distributing the materials vary—some SLGs will be available for purchase, others will be exchanged. All arrangements should be made directly with the contacts identified in this document.

Alberta Education is acting **strictly as a facilitator** in this initiative and does not take any responsibility for the quality and scope of the SLGs prepared by other developers. **It is the responsibility of the SLG developer to ensure that copyright regulations are honoured**. Furthermore, Alberta Education's direct involvement in SLG development will wane as others take over the distribution mechanism.

Attached is a *Summary of Development* of CTS SLGs in the 22 strands. The information included in this document may change as developers' plans and resources change. Please complete and return the "SLG Development Directory, Registration Form" if you wish to share your SLGs.

Note #1: SLGs prepared for modules from curriculum drafts used in field review and during the optional implementation may not be current or appropriate, as final changes to the modules may be or may have been substantial.

Note #2: By including your name as a developer within this matrix, you might receive numerous contacts. You may wish to obtain any necessary approvals from your school system and any copyright clearances, and to specify the most efficient method of contact.

Definitions

CTS Module is part of the curriculum document that represents a group of learnings. Each module includes a set of learner outcomes (module learner expectations), suggested emphasis, criteria, conditions and standards for assessing these outcomes, references to assessment tools available and specific learner expectations (SLE) to help teachers develop assignments/activities related to the module. Modules are located in each strands' *Guide to Standards and Implementation*, Sections D, E and F.

Student Learning Guides guide students through activities and direct them to identified resources. An SLG can replace teacher lessons plans and can be used for a variety of delivery strategies including individualized, group or classroom instruction.

Distance Learning Modules are self-contained learning packages. These modules, designed by distance learning, are both the resource and the student learning guide in one. See the SLG Contact Directory for information on how to contact Alberta Distance Learning and Distance Learning Options South.

A. What is a Student Learning Guide?

- A Student Learning Guide (SLG) is a presentation of information and direction that will help students attain the expectations defined in a specified CTS module. It is designed to be used by students under the direction of a teacher. A SLG is not a self-contained learning package such as you might receive from the Learning Technologies Branch (LTB) (formerly Alberta Distance Learning Centre (ADLC) or Distance Learning Options South (DLOS).

- Each SLG is based on a module of curriculum as written in a *Guide to Standards and Implementation* for one of the 22 different CTS strands.

- The SLG is written with the student in mind and makes sense to the student in the context of your program.

- Copyright law must be observed when preparing CTS documents including student learning guides. Refer to:
  - *revised (1997) Copyright Act*
  - *Copyright* and the *Can Copy Agreement.*

B. What is the difference between SLGs and traditional teacher lesson plans?

- Student Learning Guides can replace teacher lesson plans.

- SLGs guide students through modules under the direction of the teacher rather than acting as a guide for teachers to present information to student

They can be used to guide:

- an entire class through a module (e.g., prerequiste modules)
- small groups
- individual students.

SLGs as lesson plans are:

more learner-centred
versus
teacher directed

more activity-based--engaging students in experiential learning
versus
planning of lectures and completing end of chapter questions

more resourced-based
versus
use of one textbook

C. Where do ideas for activities come from?

- Criteria and Conditions attached to a module learner expectation
- Specific Learner Expectations
- Assessment Tools
- Projects and assignments you have used in your programs in the past
- Networking with other teachers
- Exchanging of Student Learning Guides
- Numerous resources available for the strand.

D. What are the components of a Student Learning Guide?

The Student Learning Guide typically has *seven* components.

1. Why Take This Module?

A brief explanation to present the rationale for the work the student will do and to set the context of the work (e.g., as it relates to the strand, the industry).

2. What Do You Need To Know Before You Start?

This specifies any prerequisites, such as important skills and/or knowledge a student should have, which will help ensure their success in the module being addressed. These prerequisites may be defined modules from within the strand, in which case you can look at the expected outcomes from these modules. They may also take the form of generic skills and/or knowledge (e.g., the ability to measure, to write, to draw simple objects, to provide fundamental information about the area being studied).

3. What Will You Know And Be Able To Do When You Finish?

This information can be drawn from the module learner expectations and the Criteria and Conditions for Assessment, because these describe the outcomes for the module and how these may be assessed. You may want to rewrite these in less formal language for student use.

4. When Should Your Work Be Done?

This provides a timeline for the student to reference and to use when planning his or her work. It will be specific to your program and to the assignments you give your students. You may want to include a time management chart, a list of all assignments that must be completed, or instructions to the student to use an agenda book or daily planner to organize his or her work.

5. How Will Your Mark For This Module Be Determined?

When a student can demonstrate all of the exit-level competencies defined for the module (module learner expectations), the teacher will designate the module as "successfully completed." You will need to reference the Assessment Criteria and Conditions, Standards, Assessment Tools and the Suggested Emphasis as written in the module and to interpret these with respect to projects/tasks you assign. Refer to Section G of the *Guide to Standards and Implementation*. The teacher will then use accepted grading practices to determine the percentage grade to be given for the module—a mark not less than 50%.

6. Which Resources May You Use?

Resources have been identified for each strand/module. These are available either through the Learning Resources Distributing Centre (LRDC) or through other agencies. Some modules may reference one main resource, while others will reference several resources. You may use the listed resources or any other resource you feel is appropriate.

7. Activities/Worksheets

Organize learner-centred activities around the module learner expectations. This will help both you and your students know when these outcomes have been successfully completed.

E. How can Student Learning Guides be developed?

To Get Started You Will Need:

1. The current *Guide to Standards and Implementation*
2. Sample Student Learning Guide (SLG) template *(see Appendix A)*
   - seven component template
   - available on disk, IBM format- Word 6.0, Mac Format Word 5.1 or
   - SLG Worksheet
3. A knowledge of the resources available to you
   - tasks and assignments currently used in your program that may apply to the SLG
   - tools and materials (in the school, in the community)
   - text, software, visual resources (see Section I of *Guide to Standards and Implementation* for list of potential resources)
   - human resources (in the school, in the community)
   - time available
   - other student learning guides
     - student learning guide matrix
     - sample student learning guides in the *Guide to Standards and Implementation*.

Procedure:

- Select a module from the *Guide to Standards and Implementation,* Sections D, E, or F
- Pull out Assessment tools available for the module Section G of the *Guide to Standards and Implementation*
- Gather and organize resources you will be using
- Write the SLG following the template
- Validate the level of difficulty/challenge in the SLG
- Make necessary adjustments.

Section II: Summary Matrixes:
Development of CTS Student Learning Guides (As of August 1997)

The most current information on student learning guides will be posted on the CTS Website **<http://ednet.edc.gov.ab.ca/cts>.**

Source[1]	Developer	AGR	CTR	CMH	COM	CON	CS	DES	ELT	E&M	ENT	FAB	FAS	FIN	FOD	FOR	INF	LGS	LOG	MAM	MEC	TOU	WLD
AB or LRDC	Alberta Education, Sample Learning Guides (1997 GSI)[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
CBE	Calgary Board of Education/Media Productions				✓	✓		✓	✓		✓	✓	✓	✓	✓		✓				✓	✓	
AD	Arlidge, Dianne												✓							✓			
BC	Brooks, Charmaine; Korte, Terry																	✓		✓		✓	
CL	Cardwell, Linda														✓								
CH	Csikos, Heather												✓		✓								
DD	Durocher, Derek					✓																	
HS	Harrison, Sherrill; Lutz, Elayne												✓										
HC	Hornofiuk, Christine													✓									
JD	Janzen, Deloris																						✓
MD	Madill, Diane												✓							✓			
SP	Menard, Donna														✓								
MN	Mathew, Norman																✓						
PM	Peter, Michael																						✓

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[1] See Source Contact Directory, pages 10–11

[2] *Guide to Standards and Implementation,* Section J

Section II: Summary Matrixes:
Development of CTS Student Learning Guides (As of August 1997) (continued)

The most current information on student learning guides will be posted on the CTS Website **<http://ednet.edc.gov.ab.ca/cts>.**

Source[1]	Developer	AGR	CTR	CMH	COM	CON	CS	DES	ELT	E&M	ENT	FAB	FAS	FIN	FOD	FOR	INF	LGS	LOG	MAM	MEC	TOU	WLD
MM	Moody, Mary; Standeven, Lisa		✓																				
PS	Paulichuk, Sonia												✓										
PD	Pritchett, Doreen														✓								
RF	Reynolds, Fred; Hunter, Connie		✓																				
SP	School Prints Inc.		✓		✓	✓							✓	✓	✓		✓						
SD	Simmons, Deanna																				✓		
IC	Shain, Michael; Kuhn, Susan				✓			✓									✓						
SH	Siemens, Helen							✓															
SH	Siemens, Helen; Jepson, Ruth												✓										
TE	Taylor, Eileen																✓						

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[1] See Source Contact Directory, pages 10–11

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Development of CTS Distance Learning Modules[1] (As of August 1997)

The most current information on student learning guides will be posted on the CTS Website **<http://ednet.edc.gov.ab.ca/cts>.**

Source[1]	Developer	AGR	CTR	CMH	COM	CON	CS	DES	ELT	E&M	ENT	FAB	FAS	FIN	FOD	FOR	INF	LGS	LOG	MAM	MEC	TOU	WLD
DLOS	Distance Learning Options South, Lethbridge		✓										✓				✓			✓			
LTB (formerly ADLC)	Learning Technologies Branch (formerly Alberta Distance Learning Centre, Barrhead)	✓									✓			✓				✓				✓	

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[1] See Source Contact Directory, pages 10–11

SLG Source Contact Directory

Contact the specific developer as noted below for further information (e.g., modules available, delivery format, purchase price or exchange strategy of Student Learning Guides and Distance Education modules.

Source Code	Source	Address Phone/Fax #
AB	Alberta Education's Website	<http://ednet.edc.gov.ab.ca/cts>
AD	Arlidge, Dianne Teacher, Ridgevalley School Peace Wapiti Regional Division	Box 59 Crooked Creek, AB T0H 0Y0 403-957-3995/Fax: 403-957-2662
ADLC LTB (formerly ADLC)	Alberta Distance Learning Centre Learning Technologies Branch (formerly ADLC)	Box 4000 Barrhead, AB T7N 1P4 403-674-5333/Fax: 403-674-6561 access production schedule at <http://ednet.edc.gov.ab.ca/ltb/400/schedule.html>
BC	Brooks, Charmaine; Korte, Terry Teachers, Crescent Heights High School Medicine Hat School District	E-mail: <chbrooks@TST-MedHat.com>
ATA	Alberta Teachers' Association, CTS Council	11010 – 142 STREET Edmonton, AB T5N 2R1 403-453-2411/Fax: 403-455-6481
CBE	Calgary Board of Education c/o Media Productions	3610 – 9th STREET SE Calgary, AB T2G 3C5 403-294-8576/Fax: 403-287-9739
CL	Cardwell, Linda	Box 465 Lacombe, AB T0C 1S0 Home: 403-782-3768, School: 403-788-3771
CH	Csikos, Heather Teacher	116 Cedarille Green SW Calgary, AB T2W 2H4 Phone/Fax: 403-281-7724
DLOS	Distance Learning Options South Lethbridge Community College	3000 College Drive South Lethbridge, AB T1K 5E9 403-382-6953/Fax: 403-329-6970
DD	Durocher, Derek	11345 – 79 Avenue Edmonton, AB T6G 0P3 403-436-5040
HC	Hornofiuk, Christine	13112 – 122 Street Edmonton, AB T5L 0E9 403-454-4152
HS	Harrison, Sherrill Lutz, Elayne Teachers, M.E. Lazerte High School Edmonton Public School District	17607 – 53 Avenue Edmonton, AB Home: 403-487-5934
IC	Inkpot Communication	2336 Cherokee Drive NW Calgary, AB T2L 0X7 403-282-4462
JD	Janzen, Deloris Teacher, Canmore Collegiate High School	154 Cougar Point Road Canmore, AB T1W 1A1 Home: 403-678-3307 School Phone: 403-678-6192 School Fax: 403-678-1902

SLG Source Contact Directory (continued)

Source Code	Source	Address Phone/Fax #
LM	Ladd, Mark	Box 6273 Peace River, AB T8S 1S2 403–624–4221/Fax: 403–624–4048
MD	Madill, Diane Teacher, Salisbury Composite High School Elk Island Public School Division	6802 – 111 Avenue Edmonton, AB T5B 0A9 Home: 403–471–2582/School: 403–67-8816/ Fax: 403–467–4555
MN	Mathew, Norman Teacher, Edmonton Public School District	7012 – 185 Street Edmonton, AB T5T 2L8 Home: 403–487–4797/School: 403–466–7331/ Fax: 403–465–5674 e-mail: <nmathew@epsb.edmonton.ab.ca>
MM	Moody, Mary	Box 702 Onoway, AB 403–967–4810/Fax: 403–967–2398
PS	Paulichuk, Sonia Teacher, Kenilworth Junior High School Edmonton Public School District	14103 – 21 Street Edmonton, AB T5Y 1C7 403–478–5788
PM	Peter, Michael	RR #1 Morinville, AB T8R 1P4 403–939–5885
PD	Pritchett, Doreen CTS Co-ordinator and Teacher St. Francis High School Calgary Separate School District	877 Northmount Drive NW Calgary, AB T2L0A3 403–289–8471/Fax: 403–284–3084
RF	Reynolds, Fred; Connie Hunter Bert Church High School	1010 Eastlake Blvd. Airdrie, AB T4A 2A1 403–948–3800/Fax: 403–948–4117
SD	Simmons, Deanna	23 Goodridge Drive St. Albert, AB T8N 2A9 403–460–3975/Fax: 403–460–5355
SP	School Prints CTS Curriculum Clearinghouse	Box 351 Acme, AB TOM 0A0 403–546–2201/403–546–2170/ Fax: 403–546–2214 e-mail: <s.elliot@schoolprints.com> <reddekop@schoolprints.com>
SM	Schuchardt, Manfred Teacher, Winston Churchill High School	1605 – 15 St N Lethbridge, AB T1H 1W4 403–328–4723 Fax: 403–329–4572 e-mail: <wchs@upanet.uleth.ca>
SH	Siemens, Helen Teacher, Lester B. Pearson High School Calgary Public School District	75 Schooner Close NW Calgary, AB T3L 1Z3 403–547–5628/School: 403–280–6565/ Fax: 403– 777–7158

Section III - Attachments

Attachment A:

1. **Worksheet for SLG Development**
2. **SLG Template (Sample developed by Alberta Education)**
3. **Completed Student Learning Guide (Sample developed by Alberta Education)**

STUDENT LEARNING GUIDE WORKSHEET

1. Why Take This Module?

2. What Do You Need To Know Before You Start?

3. What Will You Know And Be Able To Do When You Finish?

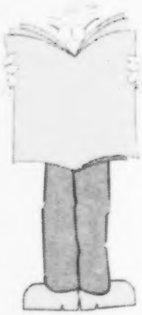
4. When Should Your Work Be Done?

5. How Will Your Mark For This Module Be Determined?

6. Which Resources May You Use?

7. Activities/Worksheets

WHY TAKE THIS MODULE?



WHAT DO YOU NEED TO KNOW BEFORE YOU START?

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

•
•
•
•
•
•
•
•

WHEN SHOULD YOUR WORK BE DONE?

12
1
2
3
4
5
6
7
8
9
10
11

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE

WHICH RESOURCES MAY YOU USE?

•
•
•
•
•
•

ACTIVITIES/WORKSHEETS

CAREER &
TECHNOLOGY
STUDIES

ENTERPRISE & INNOVATION

SAMPLE STUDENT LEARNING GUIDE

ENT1010 Challenge & Opportunity

ENT1010 Challenge and Opportunity

WHY TAKE THIS MODULE?

- ☐ You will gain an appreciation for the field of entrepreneurship.
- ☐ You will discover many different ideas and opportunities as well as techniques to come up with these ideas.
- ☐ You will understand the importance of a well-developed plan and how to assess the plan.
- ☐ You will consider career options in entrepreneurship.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

There are no prerequisites identified for this module.

However, you must be able to offer ideas and suggestions and demonstrate a high degree of classroom participation.

ENT1010 Challenge and Opportunity

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

Upon completion of this module you will be able to:

- demonstrate competencies in:
  - identifying opportunities
  - creating and generating ideas
  - establishing needs, wants and priorities
  - assessing alternatives
  - assessing environmental impact
- describe career options where enterprise and innovation are particularly important
- identify and compare a variety of venture opportunities
- identify various forms of business ownership
- identify the components of a venture plan
- demonstrate basic competencies.

WHEN SHOULD YOUR WORK BE DONE?

Your teacher will give you a timeline for completing tasks and assignments within this module.

You may also wish to use a time-management planning chart to preplan the work that needs to be done in this module. Plan how you will use your class time as well as extra time needed to complete the assignments in this module.

12
1
2
3
4
5
6
7
8
9
10
11

ENT1010 Challenge and Opportunity

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
You must first demonstrate **all** of the competencies required for this module.	
When you have done this, your percentage mark for the module will be determined as follows.	
☐ Logbook Record consisting of a minimum of five entries that provide evidence of error in applying various strategies to generate and assess ideas individually and in a group.	30%
☐ Analysis of four entrepreneurial ventures using videos, magazine articles, books/newspaper.	20%
☐ Concept Test on the means of entering a business, components of a venture plan, business regulations and social responsibilities.	20%
☐ Written or Oral Presentation on interviewing an entrepreneur.	15%
☐ Personal Profile that illustrates your own entrepreneurial characteristics.	15%

WHICH RESOURCES MAY YOU USE?

☐ *The Entrepreneurial Spirit* (Liepner, DeJordy, Schultz).
☐ *Entrepreneurship: Creating a Venture* (Kretchman, Cranson, Jennings).
☐ *Entrepreneurship for Canadians - The Spirit of Adventure*. Video Series.
☐ *Creativity in Business: An Entrepreneurial Approach* (Loucks, Luczkiw).
☐ Community resources and entrepreneurs.
☐ Magazines resources in the classroom.

ENT1010 Challenge and Opportunity

ACTIVITIES/WORKSHEETS

A **Logbook** must be maintained as your tool for time management and organizational skills. Use the logbook to record your:

- schedule
- appointments
- performance
- activities.

It must be organized, up-to-date and submitted upon request. Insert the "Student Activity Profile" as page 1 in your logbook. This will help you keep track of assignments you have completed and handed in.

1. Form a group of four to six students. On the flipchart paper and felts provided, identify challenges and changes that Canada faces today. Rewrite the list of at least 10–15 challenges in your logbook.

2. In your same groups, take out your logbook. In your logbook, on the first blank page put the heading "What Bugs Me!" On the second page put the heading "Needs." On the third page, put the heading "Wants." On the fourth page, put the heading "Problems." Now, in any order, complete each page with at least 8 needs that you perceive you (or high school students) to have; 8 wants that you can determine; 8 problems that spring to mind; and 8 things that "bug you." From this list, we will brainstorm as a class to see opportunities that may arise as a result. Instructors may want to expand this list as the module develops and the students gain and understanding of how to look at problems as opportunities. Students should make a note at the bottom of their last page to indicate how the group came up with their ideas. What strategies did they use? How did they determine who was group recorder? All this will help them in the future modules to determine leaders and followers.

3. As your instructor deems appropriate, we will venture into some creativity exercises that allow you to see things other than the way they really are. In your logbook, generate a list of possible uses for a single item. For example, given a simple brick, determine 20 possible uses for that brick. Students may wish to form groups or partners here to brainstorm and piggy-back ideas.

4. Create a poster/collage/bulletin board display that depicts a trend or fad that has the local, regional, national or international market in the past five years. Use classroom resources, magazines, newspapers and TV shows that are applicable, and any other medium you require to prepare your poster/collage or display.

5. View "Program #1: Catch the Spirit" from the series *Entrepreneurship for Canadians: The Spirit of Adventure* and use what they learned from the video to:
   - make a list of characteristics they think are common among, or important for, entrepreneurs
   - describe what they think entrepreneurs do and the contributions they can make to society
   - describe what they think are the important factors "motivating" entrepreneurs
   - summarize the contribution made by one of the entrepreneurs profiled in the video.

6. Generate a minimum of five ideas, alternatives and strategies to identify and determine viable opportunities within your community.

ENT1010 Challenge and Opportunity

7. View "Program #4: Ideas and Innovations" from the series *Entrepreneurship for Canadians: The Spirit of Adventure* and prepare a list entitled "Criteria for Assessing Ideas".

8. Read *Entrepreneurship—Creating a Venture* section on "Roles and Thinking Skills in the Problem Solving Process" (pages 66–71). Complete the questions entitled "Your Turn" on pages 71–72. Put the answers in your logbook.

9. One method of idea generation is webbing. Start with a central theme or idea and web out extensions of the idea from there. In your logbooks, come up with at least 5 different ways for a person to:
   - water-ski
   - travel on vacation
   - take notes in class
   - do a report
   - walk a dog
   - go tobogganing.

10. As a class, discuss the sayings "There is nothing more dangerous than having an idea—when it is the only one you have" and "being married to an idea". Discuss failure and its implications as an opportunity to learn.

11. Using chapters 11 and 12 of your text *The Entrepreneurial Spirit* or a business contact that you have made, determine the start-up requirements, risks, financial and personal sacrifice, skills required and words of advice that should be heeded when doing ONE of the following:
    - starting a new business from scratch
    - purchasing an existing business
    - purchasing a franchise
    - becoming involved in network marketing
    - planning a "fundraising" event.

    You may choose to do this through an informal talk and prepare a written analysis, or through a formal interview, perhaps an audio/visual presentation would be a suggested format for interest and background on the company or business you are doing, or by organizing an entrepreneur/intrapreneur/volunteer to come in and talk with your class about the way he or she got into business ownership. Write your questions down in your logbook along with the responses you learned from your entrepreneur.

12. Using Yellow Pages, Chamber of Commerce Information, newspapers, Business Advisory Network Book, etc., determine at least 12 non-profit ventures that run in your community. When your list is complete, determine a definition of a non-profit organization and what their purpose is.

13. As a class, we will determine the process of creating a venture plan. This includes the question "What things do you need to consider before going ahead with a business idea?"

14. Now, brainstorm as a group/class as to the actual components that should be included in a venture plan. Ensure that you have each of the components written down in your notes. You should have a good understanding of EACH component of a business plan and what its contents should be.

ENT1010 Challenge and Opportunity

15. Pick ONE of the areas of the business plan and prepare a summary on what a business plan should include with regards to that area; e.g., if you are doing executive summary, you give a brief, overall view of what an executive summary is and what it should contain. Then, from a sample business venture, prepare that area of the business plan that you are expanding on. You will explain to the rest of the class, the section you picked, the overall view of the area and the sample of what it would actually contain if the business venture idea were to run.

16. From our venture plan and presentations, what limitations do we have upon us that may inhibit the success of the venture? We will discuss this as a class and write down our findings in our logbooks.

17. What criteria need to be considered to assess the feasibility of an opportunity/idea? That is, what will you do to see if an opportunity/idea you came up with actually has merit and a chance to succeed? Consider an opportunity for your student council to have a fund-raiser for the school to promote school spirit and a community awareness campaign. From this idea, prepare a feasibility analysis of the idea with such considerations as:
    - brief description
    - objectives of the idea
    - resources required to achieve objectives
    - time line required to implement the idea
    - limitations as outlined in activity #16.

18. Pick an entrepreneur within the community. See the resource, *Creativity in Business—An Entrepreneurial Approach*, for a sample guide with questions that you could ask an entrepreneur. Set up an interview time, determine the specific questions you would like to ask, conduct the interview, complete a good copy (if necessary), summarize what you have learned in paragraph format, and finally, send the entrepreneur a thank-you note for his or her time and assistance in helping you understand more about entrepreneurship. If your presentation is oral, set up a time with your instructor to share your information. If your format is written, ensure it is well presented and organized, preferably done on computer to edit and revise.

19. When someone is trying to determine what kind of business venture to become involved in, they have many options to research from personal interviews, Internet access to information, meetings, conferences or seminars, trade publications, business books from library or bookstore, or magazine articles. Because of our limitations in time and access, our options to research business venture ideas are bound to a couple options. As one of your final assignments in this module, you must research and compare **four** different business ventures. Your research on each must cover the following components:
    - history/background of the entrepreneur
    - description of the venture
    - risks involved in the venture and how to minimize them
    - resources required to fund the venture
    - environmental impact of the venture (or other applicable impact)
    - conclusion—which of the four ventures has the most potential and justify.

    Resources you should be using for this assignment are publications, magazines (such as *Fortune, Canadian Business, Small Business Opportunities, Entrepreneur*) and/or newspaper articles.

20. Complete the concept test for Module ENT1010: Challenge & Opportunity.

ENT1010 Challenge and Opportunity

Student Activity Profile

Module:____

Student Name:_____________________________

Date	SLG#	Description of Activity	Completion Date	Mark	Weighting
	1–3	Participation in Class			
	4	Trends Display/Poster/Collage			
	5	Video Program #1 and Reflective Questions			
	6	Opportunities in the Community			
	7	Video Program #4 and Criteria for Assessing Ideas			
	8	Problem-Solving Process Questions, Kretchman Text, pp. 71–72			
	9/10	Summary/Idea Generation			
	11	Styles of Business Ownership			
	12	Non-profit Organizations in Community			
	13/14	Participation in Class			
	15/16	Business Plan Components and Limitations			
	17	Feasibility Analysis			
	18	Interview an Entrepreneur			
	19	Analysis/comparison of Four Business Ventures			
	20	Concept Test			

CAREER &
TECHNOLOGY
STUDIES

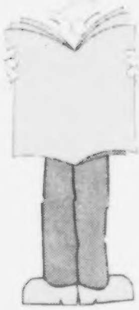
MANAGEMENT AND MARKETING

SAMPLE STUDENT LEARNING GUIDE

MAM1010 Management & Marketing Basics

MAM1010 Management and Marketing Basics

WHY TAKE THIS MODULE?



- Gain an understanding of how management and marketing concepts relate to your everyday life
- Familiarize yourself with the role of management and marketing in business
- Realize the importance of retailing in marketing
- Recognize retail merchandising strategies used by businesses to increase sales
- Appraise personal talents and interests related to careers within management and marketing.

WHAT DO YOU NEED TO KNOW BEFORE YOU START?

There are no prerequisites identified for this module.

However, your past and current management and marketing experiences will assist you in completing this module.

MAM1010 Management and Marketing Basics

WHAT WILL YOU KNOW AND BE ABLE TO DO WHEN YOU FINISH?

Upon completion of this module you will be able to:

- identify key business and marketing terms
- relate management concepts to:
  - his or her personal life
  - organizations he or she is involved in
  - different types of businesses (large and small)
- describe the characteristics of marketing and decisions made within the marketing mix
- describe the role of retailing:
  - in Canadian history
  - in Canada today
  - in Canada in the future
- identify and analyze retail merchandising strategies used in the marketplace today
- identify management and marketing careers of personal interest
- demonstrate basic competencies.

WHEN SHOULD YOUR WORK BE DONE?

Work should be completed by ______________________________

Use the timelines shown below to help you schedule your time. Prepare a workplan outlining when you will complete the tasks listed below. Submit this workplan to your teacher for approval. Remember, you should use your time and resources as efficiently as possible so that you can complete the module and move onto other opportunities to develop your knowledge and skills. If you find that you need to adjust your workplan; be sure to consult with your teacher.

TASK 1: 4 hours
TASK 2: 4 hours
TASK 3: 5 hours
TASK 4: 5 hours
TASK 5: 5 hours
TASK 6: 2 hours

Complete the time management planning chart included in this module.

12
1
2
3
4
5
6
7
8
9
10
11

MAM1010 Management and Marketing Basics

HOW WILL YOUR MARK FOR THIS MODULE BE DETERMINED?

	PERCENTAGE
You must first demonstrate **all** of the competencies required for this module. When you have done this, your percentage mark for the module will be determined as follows:	
• TASK 1: Basic Business Activities/Concept Test (see worksheet/MAM1010–1)	5%
• TASK 2: Personal Management Project (see worksheet/MAM1010–2)	15%
• TASK 3: Marketing Project (see worksheet/MAM1010–3	20%
• TASK 4: Role of Retailing Presentation (see worksheet/MAM1010–4)	
• TASK 5: Retail Merchandising Observation Report	
• TASK 6: Personal Inventory of Self	
• demonstrate basic competencies	

WHICH RESOURCES MAY YOU USE?

- Stoyles, Harold. *Marketing Today: A Retail Focus.* Chapters 1–3
- Murphy, Terry. *The World of Business.* 3rd Ed. Chapters 3 and 4
- Levin, Sandy. *Marketing Dynamics.* Chapter 1
- Cranson, Lori. *Managing for Excellence.* Chapters 5 and 7
- Taller, Terry. *Marketing: A Canadian Perspective.* Chapter 1
- Stewart, Margaret. *Marketing: A Global Perspective.* Chapter 1
- *Supermarket Persuasion.* Video. Learning Seed Co.

ACTIVITIES/WORKSHEETS

Time Management Planning Chart

Using the chart below preplan the work that needs to be done in this module. Plan on how you will use your class time as well as extra time that you will need to complete the assignments in this module. The chart below will help you develop a five-week workplan.

Name ______________________________

Month ___________________________

Monday	Tuesday	Wednesday	Thursday	Friday

MAM1010 Management and Marketing Basics

Business Basics Activities	**Worksheet/MAM1010–1**

Module Learner Expectation: Identify key business systems and strategies used in the marketplace.

The following activities will prepare you for successful completion of a concept test related to basic business terminology and economic systems and strategies.

Activities:

→ Resource: *The World of Business*, Chapter 1. Complete activities 1 and 2 or 3 and 4.

1. Review and respond to the expectations of Chapter 1 – Business and You, page 14.
2. Complete the matching questions on page 29 – Building Your Business Vocabulary.
3. Review business vocabulary by completing the Business and You Crossword Puzzle.
4. Select and complete 5 out of the 10 Applying your Business Knowledge, page 30.

→ Resource: *The World of Business*, Chapter 2. Complete activities 1 and 2 or 3 and 4.

1. Review and respond to the expectations of Chapter 2, Economic Systems, page 33.
2. Complete the matching questions on page 53 – Building Your Business Vocabulary.
3. Review business vocabulary by completing the Economic Systems Crossword Puzzle.
4. Select and complete 5 out of the 10 Applying your Business Knowledge, page 54.

→ Resource: Newspapers and magazines
The World of Business blackline masters 39, 40, 41

- **Business Facts:** Check recent newspapers and magazines and write four current business facts. Identify the source. Use blackline master #39.
- **Environmental Alerts:** Check recent newspapers and magazines and write two current environmental alert items related to business. Identify the source. Use blackline master #40.
- **Business Survival Tactic:** Check recent newspapers and magazines and write a short summary of how a company is changing its procedures to survive or expand. Identify the source and source date. Use blackline master #41.

- **Take the concept test related to business terminology and economic systems.**

MAM1010 Management and Marketing Basics

Management Project **Worksheet/MAM1010–2**

Module Learner Expectation: Relate management concepts to her or his personal life, organizations he or she is involved with and different types of businesses (large and small).

Activities:

- Before completing this activity you should be familiar with the roles of management in different organizations. Select at least one of the following resources to obtain the necessary background information.

  → *The World of Business* by Terry Murphy, et. al., Chapter 3 and 4.
  → *Managing for Excellence* by Lori Cranson, Chapter 5 and 7.

- Reflect upon ways you use management in your personal life. Include the ways you plan, organize, action your plans, monitor and communicate. How might you improve yourself through increasing the effectiveness of your management skills?
- Interview at least one family member and friend to find out the role management plays in his or her personal life.
- How is management used in your household?
- Identify the features of the different types of businesses:
  - → sole proprietors
  - → partnerships
  - → corporations (conglomerates, multinationals, Crown)
  - → franchises
  - → cooperatives
- Interview three people involved in business. At least one should be involved in a large business (corporation), the other in a small business (proprietorship or partnership). How is the business managed? Is it effective? Why or why not? Who are the decision-makers in the business?
- **Present your reflections and interviews in your choice of format. This could be written, illustrated, video. The choice is yours!**
- **Assess your project using the Presentations/Reports Assessment Tool: Management and Marketing Project**

MAM1010 Management and Marketing Basics

Marketing Project **Worksheet/MAM1010–3**

Module Learner Expectation: Describe the characteristics of marketing and decisions made within the marketing mix.

Supplies: popsicle sticks, dixie cups and glue. For the purpose of computing production costs for this project the following values have been assigned to the supplies:

Cups	=.10 each
Popsicle Sticks	=.05 each
Glue	=.25 per unit

Activities:

- Before completing this activity you should be familiar with the characteristics of marketing, the marketing mix and the types of decisions necessary to bring a product to market. Select at least one of the following resources to obtain the necessary background.
  - → *The World of Business* by Terry Murphy, et. al., Chapter 25.
  - → *Marketing Dynamics* by Sandy Levin, Chapter 1.
  - → *Marketing: A Global Perspective* by Margaret Stewart, et. al., Chapter 1.
  - → *Marketing: A Canadian Perspective* by Terry Taller, Chapter 1.
- Individually or in pairs create a prototype product that has marketable potential using the above supplies.
- Make a list of marketing decisions necessary to bring the product to the marketplace. Develop a minimum of 5 decisions for each of the 4 Ps and 2 Cs of the marketing mix.
  - ☐ Product (name)
  - ☐ Price (cost)
  - ☐ Place (where to sell it?)
  - ☐ Promotion (will you advertise?)
  - ☐ Consumer (who will buy it?)
  - ☐ Competition (who is in the marketplace already?)
- Make decisions regarding the product for the 4 Ps and 2 Cs of the marketing mix.
- Share your product and marketing decisions with a minimum of 5 potential customers.
- Make recommendations regarding the marketability of your product based on your knowledge of the marketing mix and feedback from potential customers.
- How does this activity relate to the marketing decisions made by manufacturers, wholesalers and retailer everyday?
- **Report on your decisions, customer reactions, recommendations and conclusions regarding the marketability of the product you created.**
- **Assess your project using the Presentations/Report Assessment Tool: Management and Marketing Project**

MAM1010 Management and Marketing Basics

Role of Retailing Presentation **Worksheet/MAM1010–4**

Module Learner Expectation: Describe the role of retailing in Canadian history, in Canada today and in Canada in the future.

Activities - Individually or in groups of two or three, complete the following activities:

- Before completing this activity you should be familiar with the role of retailing in Canada, past, present and future. Use the following resource to obtain the necessary background.

  → *Marketing Today: A Retail Focus* by Harold Stoyles, Chapters 1–3.

- Report (oral, written or visual) on the role and functions of retailing in the marketplace.
- Prepare a visual timeline that represents the evolution of retailing from its beginnings to its current role in the marketplace.
- Report on the role technology has played in the evolution of retailing.
- Make suggestions regarding the future of retailing and the role technology might play.
- **Presentation: organize all of the above activities into a presentation and present them to your teacher.**
- **Assess your work using the Presentations/Reports Assessment Tool: Management and Marketing Project**

Retail Merchandising Scavenger Hunt Worksheet/MAM1010–5

Module Learner Expectation: Identify and analyze retail merchandising strategies used in the marketplace.

Directions: Watch the video *Supermarket Persuasion*. **Explore popular local supermarkets** to find merchandising strategies presented in the video. Questions below help you explore local supermarkets. Questions within the boxes encourage you to make conclusions about retail merchandising strategies. Respond formally to these questions using the information you have gathered from your exploration. **Plan and complete a report and/or presentation** that presents your conclusions about retail merchandising strategies used in supermarkets.

1. Compare the price of regular popcorn kernels with that of microwave popcorn per kilogram.
2. Compare the price of instant rice with regular rice on a per kilogram basis. Estimate how much time instant rice saves over regular rice.
3. Compare the price of orange juice in a carton or jar with orange juice made from frozen concentrate. Compare prices based on an eight ounce serving.
4. Compare the price of fresh fish with frozen fish sticks on a per kilogram basis.
5. Compare the price/kilogram of the following types of potatoes (compare national brands):
   - fresh potatoes in the produce department
   - frozen french fries
   - freeze-dried instant mashed potatoes
   - potato chips
6. What pricing merchandising strategies have you discovered from all of these price comparisons?
7. Prepare a list of 15 common grocery items. Compare these prices in three different supermarkets and add up the total bill for each.
8. Identify three products offering multiple pricing. Is there a significant savings when buying more than one?
9. Find three brands of the same food in packages that appear to be the same size but contain differing amounts of food. Compare prices.
10. Find a package that appears larger than the same food in the competing brand yet contains the same amount of food or less. Compare prices.
11. What additional pricing merchandising strategies have you discovered?
12. Draw a store layout of a supermarket. Does it follow the power of the perimeter approach? Explain.
13. Explore the following supermarket departments and describe a minimum of 3 merchandising techniques used to increase sales in each department.

    produce, bakery, deli, meat, dairy, grocery

14. What place merchandising strategies have you discovered?

15. Study the detergent section of a supermarket. Find out which companies are behind the brand names. Estimate what percentage of shelf space is controlled by the two leading companies.

16. Study the cereal display in a supermarket. Which companies control most of the shelf space? List the brands made by any one company.

17. Study the soft drink section in your local supermarket. Find out which companies are behind the brand names. Estimate what percentage of floor or shelf space is controlled by the two leading companies.

18. Find a package that is oversized in comparison to its contents.

19. Find a local supermarket with a high quality house brand. How do they compare in quality and price to national brands?

20. Find a local supermarket with generic foods. How do they compare in quality and price to the national brands?

21. What product merchandising strategies have you discovered?

22. Find a full page newspaper ad or flyer showing food prices. How many of the prices end in the number nine? Show the ad.

23. Walk the inner aisles of a supermarket. How many "shelf talkers" can you find? What is the most common message?

24. Find three tie-in displays in the supermarket. Describe the display. Is one item on sale, both, or neither?

25. Look for three end of aisle displays. Note the price of the items. Are they reduced or at normal price?

26. Find an example of a tumble or dump display. Is the price greatly reduced, slightly reduced, or the same as always?

27. What promotional merchandising strategies have you discovered?

28. Compare services for three different supermarkets. Compare store hours, credit available, loyalty programs, deliver, etc.

29. What service merchandising strategies have you discovered?

30. In your observations in the supermarkets, what additional merchandising strategies have you discovered?

This worksheet has been adapted from the Supermarket Persuasion support material that comes with the video. It has been adapted to reflect metric measurements and the specific learner expectations of Module 1010 in Management and Marketing.

MAM1010 Management and Marketing Basics

Personal Inventory of Self **Worksheet/MAM1010–6**

Module Learner Expectations: Identify management and marketing careers of personal interest.

Activities:

→ Resource: *Marketing Today: A Retail Focus*, 2nd Edition, Teacher's Resource, blackline master, page 221, Personal Profile Sheet.

- Complete the Personal Profile Sheet to identify personal talents, skills, interests and qualifications.
- Research and find management and marketing careers that match your personal talents, skills, interests and qualifications.
- Investigate a minimum of three careers within the management and marketing field that you would be interested in pursuing *(use Assessment Tool: MAMCARE: Career Profiles).*

Attachment B: Registration Form

Student Learning Guide Development Directory
Registration Form

Please complete this form if you would like to be included in the Student Learning Guide Development Directory.

Developer Name: ____________________

Contact Name (if appropriate): ____________________

Address: ____________________

____________________ Postal Code: ____________________

Telephone: ____________________ Fax: ____________________

E-mail: ____________________

Strand(s):

☐ ____________________ ☐ ____________________
☐ ____________________ ☐ ____________________
☐ ____________________ ☐ ____________________

☐ System

☐ Specialist Council

☐ Organization

☐ Individual/Teacher

☐ ____________________

Please return this form to:

CTS UNIT
CURRICULUM STANDARDS BRANCH
ALBERTA EDUCATION
DEVONIAN BUILDING
11160 JASPER AVENUE
EDMONTON AB T5K 0L2
Telephone: 403–422–4872*/Fax: 403–422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

I would like the above information to be included in the Student Learning Guide Development Directory:

Note: By including your name as a developer within this matrix, you may receive numerous contacts. Obtain any necessary approvals from your school system and any copyright clearances, and specify the most efficient method of contact.

____
Signature

CAREER & TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 12:

Assessing Student Achievement in CTS

(Background and Generic Assessment Tools)

August 1997 (Interim)

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Purpose

> ***CTS is a competency-based program, and the assessment of student achievement is essential to its successful implementation and ongoing credibility.***
>
> ***Our goal is to:***
>
> - ***establish assessment standards that are fair and credible, and challenge junior and senior high school students as they proceed through the CTS program***
> - ***to develop assessment standards that will be applied consistently throughout the province.***
>
> ***CTS Team***
> ***August 1997***

For further information contact:
Career and Technology Studies Unit,
Curriculum Standards Branch
Devonian Building West
11160 Jasper Avenue
Edmonton, Alberta T5K 0L2
Telephone: 403–422–4872*; Fax: 403–422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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A. DEVELOPING AND VALIDATING ASSESSMENT STANDARDS IN CTS

The CTS curriculum supports the key principles of results-based curriculum through:

1. how the curriculum is structured
2. the type and range of learning, teaching and support resources being identified
3. expanded delivery opportunities at the classroom, school and system level.

WHY ARE ASSESSMENT STANDARDS IMPORTANT TO CTS?	Assessment standards are essential to the effective delivery of the curriculum standards. In CTS, assessment standards: • establish an appropriate level of challenge and rigor • relate directly to the type of learning described in the curriculum standard • are easy to understand • are efficient to implement • provide a consistent measure of what was expected to be measured.
STANDARDS DEFINED	Assessments standards are a key component to a results-based curriculum. A results-based curriculum, as defined by Alberta Education, has three types of standards: • *Curriculum Standards* - describe what a student must *know and be able to do* in order to be successful in a particular module • *Assessment Standards* - define how the student's performance will be *judged* • *Achievement Standards* - describe *how many students across the province* will achieve a particular standard. CTS focuses on curriculum standards *and* assessment standards.

WHAT ARE ASSESSMENT STANDARDS?	The CTS assessment standards assess two basic forms of competency:
	• What can a student ***do***?
	  • **make** a product (e.g., wood bowl, report, garment)
	  • **demonstrate** a process
	    • strand-related competencies (e.g., keyboarding, haircutting, sewing techniques, lab procedures)
	    • basic competencies (e.g., resource use, safety procedures, teamwork)
	• What does a student **know**?
	  • knowledge base needed to demonstrate a competency (link theory and practice).

CTS DEFINES *SUMMATIVE* ASSESSMENT STANDARDS	The assessment standards and tools defined for the CTS modules, referenced in Sections D, E and F of the *Guide to Standards and Implementation* for each CTS strand, focus on the final (or summative) assessment of student achievement. Assessment throughout the learning period (formative assessment) will continue to assess how students are progressing. Teachers direct and respond to students' efforts to learn—setting and marking tasks and assignments, indicating where improvement is needed, sending out interim reports, congratulating excellence, etc. Teachers will decide which instructional and assessment strategies to apply during the formative learning period. Because formative and summative assessment are closely linked, some teachers may wish to modify the tools included in this section to use during the instructional process. Teachers may also develop their own summative assessment tools as long as the standards are consistent with the minimum expectations outlined by Alberta Education.
GRADING AND REPORTING STUDENT ACHIEVEMENT IN SENIOR HIGH	When a student can demonstrate ALL of the exit-level competencies defined for the module (module learner expectations), the teachers will designate the module as "successfully completed." The teacher will then use accepted grading practices to determine the percentage grade to be given for the module — a mark not less than 50%. The time frame a teacher allows a student to develop the exit-level competency is a local decision. NOTE: *The Senior High School Handbook* specifies that students must have access to 25 hours of instruction for each credit. Students may, however, attain the required competencies in less time and may proceed to other modules. Teachers are encouraged to consult their colleagues to ensure grading practices are as consistent as possible. High school teachers may wish to refer to Appendix 2: Tracking and Reporting Student Achievement in CTS" for information on how to use the CTS course codes to report the credits that students have earned to Alberta Education. (Copies of this document have been forwarded to superintendents and senior high school principals.)

GRADING AND REPORTING STUDENT ACHIEVEMENT IN JUNIOR HIGH	Junior high schools may deliver concepts from several modules and strands and need not complete all the Module Learner Expectations (MLEs) in a particular module. A module does not have to be completed in a given school year. It can be divided up and be delivered over a two or three year period. However, over the three years in junior high, with up to 450 hours of access to CTS instruction, some junior high students will obtain all the competencies and successfully complete CTS modules (advisable particularly for prerequisite modules.) The senior high school principal may accept a recommendation from the junior high school principal that a student has successfully completed a module and should be given credit. This module can then be included when reporting student achievement through the normal student records system. The module(s) will also then be included in the student's transcript. Note: The module challenge provision does not apply to these students. More information is available in the *Funding for School Authorities: A Manual for School Jurisdictions, Private Schools and Private ECS Operators.*
COMPONENTS OF ASSESSENT STANDARDS IN CTS	The following components are included in each module: • **module learner expectations** (shaded left column of the module) define the exit-level competencies students are expected to achieve to complete a module. Each MLE defines and describes critical behaviours that can be measured and observed. The student must meet the standard specified for **ALL** MLEs within a module to be successful and receive credit in senior high school. • **suggested emphasis** (right column of the module) provides a guideline for the relative significance of each MLE and can be used to organize for instruction. • **criteria and conditions** (middle column of the module) set the framework for the assessment of student competency, specifying the minimum standard for performance and including a reference to assessment tools, where appropriate.
CRITERIA	*Criteria* define the behaviors that a student must demonstrate to meet the designated standard. For example the criteria could describe the various techniques that must be demonstrated when using a tool, and/or describe the minimum components of a project the student must complete.
CONDITIONS	*Conditions* outline the specifications under which a student's competency can be judged. For example, conditions could specify whether the assessment should be timed or not, or if the student should be allowed to access to support resources or references.
STANDARD	*Standard* - The *standard* may be defined by (1) assessment tools, which are included in Section G of the Guide to Standards and Implementation for each strand (or sometimes in approved learning resources) and/or (2) "illustrative examples" of student work if appropriate.

ASSESSMENT TOOLS	*Assessment Tools* tend to be of two types: • tools generic to a strand or to the entire CTS program; e.g., a standard 5-point rating scale is used in all strands. Other generic tools include assessing reports and presentations and lab safety checklists. *(Names of these tools include the strand code (e.g., "INF" for Information Processing and a code for the type of tool (e.g., "TDENT" for Text-Data entry).)* • tools specific to a module; e.g., assessment checklist for assessing a venture plan in Enterprise and Innovation or a checklist for sketching, drawing and modeling in Design Studies. *(Names of these tools include the module code; e.g., "INF1010-1" indicating that it is the first module-specific tool used in Information Processing module 1010.)*

B. ASSESSMENT TOOLS GENERIC TO CTS

Assessment of student achievement in CTS involves determining what a student KNOWS and CAN DO. How we go about determining what our students know and can do involves assessment of a product, and assessment of the processes used to create the product.

Each strand defines a set of assessment tools that help the teachers determine whether or not a student has met the standard for a particular module. Such tools could include any of the following:

- checklists
- reference guides/assessment frameworks
- illustrative examples (print, audio, visual, or actual product).

This section includes some frameworks that have been developed to assess student performance. These assessment tools can be applied within each module, within a strand or across CTS. For example, the *Basic Competencies Reference Guide* describes observations that could be used in each of the modules to assess one or more of the following behaviours:

- managing learning
- managing resources
- problem solving and innovation
- communicating effectively
- working with others
- demonstrating responsibility.

The following frameworks are used in CTS strands, and provide a consistent reference for assessment of such processes as:

- issue analysis
- lab investigations
- negotiations and debate
- presentations/reports
- research process.

These assessment frameworks have been adapted for use in specific strand(s) and/or modules. For example, the assessment framework: Lab Investigations (CTSLAB) has been adapted for use in a module in the Forestry strand as:

- *Field Investigations: Soil, Air and Water (FOR3090-2)*

BASIC COMPETENCIES REFERENCE GUIDE

The chart below outlines basic competencies that students endeavour to develop and enhance in each of the CTS strands and modules. Students' basic competencies should be assessed through observations involving the student, teacher(s), peers and others as they complete the requirements fo each module. In general, there is a progression of task complexity and student initiative as outlined in the Developmental Framework★. **As students progress through Stages 1, 2, 3 and 4 of this reference guide, they build on the competencies gained in earlier stages.** Students leaving high school should set themselves a goal of being able to demonstrate Stage 3 performance.

Suggested strategies for classroom use include:

- having students rate themselves and each other
- using in reflective conversation between teacher and student
- highlighting areas of strength
- tracking growth in various CTS strands
- highlighting areas upon which to focus
- maintaining a student portfolio.

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
Managing Learning			
☐ comes to class prepared for learning	☐ ───▶───▶	☐ ───▶───▶	☐ ───▶───▶
☐ follows basic instructions, as directed	☐ follows instructions, with limited direction	☐ follows detailed instructions on an independent basis	☐ ───▶───▶
	☐ sets goals and establishes steps to achieve them, with direction	☐ sets clear goals and establishes steps to achieve them	☐ demonstrates self-direction in learning, goal setting and goal achievement
☐ acquires specialized knowledge, skills and attitudes	☐ applies specialized knowledge, skills and attitudes in practical situations	☐ transfers and applies specialized knowledge, skills and attitudes in a variety of situations	☐ transfers and applies learning in new situations; demonstrates commitment to lifelong learning
☐ identifies criteria for evaluating choices and making decisions	☐ identifies and applies a range of effective strategies for solving problems and making decisions	☐ uses a range of critical thinking skills to evaluate situations, solve problems and make decisions	☐ thinks critically and acts logically to evaluate situations, solve problems and make decisions
☐ uses a variety of learning strategies	☐ explores and uses a variety of learning strategies, with limited direction	☐ selects and uses effective learning strategies	☐ ───▶───▶
		☐ cooperates with others in the effective use of learning strategies	☐ provides leadership in the effective use of learning strategies
Managing Resources			
☐ adheres to established timelines; uses time/schedules/planners effectively	☐ creates and adheres to timelines, with limited direction; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines on an independent basis; prioritizes task; uses time/schedules/planners effectively	☐ creates and adheres to detailed timelines; uses time/schedules/planners effectively; prioritizes tasks on a consistent basis
☐ uses information (material and human resources), as directed	☐ accesses and uses a range of relevant information (material and human resources), with limited direction	☐ accesses a range of information (material and human resources), and recognizes when additional resources are required	☐ uses a wide range of information (material and human resources) in order to support and enhance the basic requirement
☐ uses technology (facilities, equipment, supplies), as directed, to perform a task or provide a service	☐ uses technology (facilities, equipment, supplies), as appropriate, to perform a task or provide a service, with minimal assistance and supervision	☐ selects and uses appropriate technology (facilities, equipment, supplies) to perform a task or provide a service on an independent basis	☐ recognizes the monetary and intrinsic value of managing technology (facilities, equipment, supplies)
☐ maintains, stores and/or disposes of equipment and materials, as directed	☐ maintains, stores and/or disposes of equipment and materials, with limited assistance	☐ maintains, stores and/or disposes of equipment and materials on an independent basis	☐ demonstrates effective techniques for managing facilities, equipment and supplies
Problem Solving and Innovation			
☐ participates in problem solving as a process ☐ learns a range of problem-solving skills and approaches	☐ identifies the problem and selects an appropriate problem-solving approach, responding appropriately to specified goals and constraints	☐ thinks critically and acts logically in the context of problem solving	☐ identifies and resolves problems efficiently and effectively
☐ practices problem-solving skills by responding appropriately to a clearly defined problem, specified goals and constraints, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ applies problem-solving skills to a directed or a self-directed activity, by: – generating alternatives – evaluating alternatives – selecting appropriate alternative(s) – taking action	☐ transfers problem-solving skills to real-life situations, by generating new possibilities ☐ prepares implementation plans ☐ recognizes risks	☐ identifies and suggests new ideas to get the job done creatively, by: – combining ideas or information in new ways – making connections among seemingly unrelated ideas – seeking out opportunities

Stage 1— *The student:*	**Stage 2**— *The student:*	**Stage 3**— *The student:*	**Stage 4**— *The student:*
			in an active manner
Communicating Effectively			
☐ uses communication skills; e.g., reading, writing, illustrating, speaking	☐ communicates thoughts, feelings and ideas to justify or challenge a position, using written, oral and/or visual means	☐ prepares and effectively presents accurate, concise, written, visual and/or oral reports providing reasoned arguments	☐ negotiates effectively, by working toward an agreement that may involve exchanging specific resources or resolving divergent interests
☐ uses language in appropriate context	☐ uses technical language appropriately	☐ encourages, persuades, convinces or otherwise motivates individuals	☐ negotiates and works toward a consensus
☐ listens to understand and learn	☐ listens and responds to understand and learn	☐ listens and responds to understand, learn and teach	☐ listens and responds to understand, learn, teach and evaluate
☐ demonstrates positive interpersonal skills in selected contexts	☐ demonstrates positive interpersonal skills in many contexts	☐ demonstrates positive interpersonal skills in most contexts	☐ promotes positive interpersonal skills among others
Working with Others			
☐ fulfills responsibility in a group project	☐ ——→——→	☐ seeks a team approach, as appropriate, based on group needs and benefits; e.g., idea potential, variety of strengths, sharing of workload	☐ leads, where appropriate, mobilizing the group for high performance
☐ works collaboratively in structured situations with peer members	☐ cooperates to achieve group results	☐ works in a team or group: – encourages and supports team members – helps others in a positive manner – provides leadership/followership as required – negotiates and works toward consensus as required	☐ understands and works within the context of the group
☐ acknowledges the opinions and contributions of others in the group	☐ maintains a balance between speaking, listening and responding in group discussions		☐ prepares, validates and implements plans that reveal new possibilities
	☐ respects the feelings and views of others		
Demonstrating Responsibility			
Attendance			
☐ demonstrates responsibility in attendance, punctuality and task completion	☐ ——→——→	☐ ——→——→	☐ ——→——→
Safety			
☐ follows personal and environmental health and safety procedures	☐ recognizes and follows personal and environmental health and safety procedures	☐ establishes and follows personal and environmental health and safety procedures	☐ transfers and applies personal and environmental health and safety procedures to a variety of environments and situations
☐ identifies immediate hazards and their impact on self, others and the environment	☐ identifies immediate and potential hazards and their impact on self, others and the environment	☐ ——→——→	☐ ——→——→
☐ follows appropriate/emergency response procedures	☐ ——→——→	☐ ——→——→	☐ ——→——→
			☐ demonstrates accountability for actions taken to address immediate and potential hazards
Ethics			
☐ makes personal judgements about whether or not certain behaviours/actions are right or wrong	☐ assesses how personal judgements affect other peer members and/or family; e.g., home and school	☐ assesses the implications of personal/group actions within the broader community; e.g., workplace	☐ analyzes the implications of personal/group actions within the global context
			☐ states and defends a personal code of ethics as required
***Developmental Framework** • *Simple task* • *Structured environment* • *Directed learning*	• *Task with limited variables* • *Less structured environment* • *Limited direction*	• *Task with multiple variables* • *Flexible environment* • *Self-directed learning, seeking assistance as required*	• *Complex task* • *Open environment* • *Self-directed/self-motivated*

FRAMEWORK FOR ASSESSMENT

SCALE	**RUBRIC STATEMENT** **(included in assessment tool/statements in *italics* are optional)** ***The student:***	**IS TASK/ PROJECT COMPLETED?**	**PROBLEM SOLVING:** **STUDENT INITIATIVE VS TEACHER DIRECTION/ SUPPORT**	**USE OF TOOLS, MATERIALS, PROCESSES**	***STANDARDS OF QUALITY/ PRODUCTIVITY***	***TEAMWORK*** ***LEADERSHIP***	***SERVICE*** ***CLIENT/*** ***CUSTOMER***
O	has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.	Has not completed defined outcomes.		Tools, materials and/or processes are used inappropriately.			
1	meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively. Provides a limited range of customer/client services.*	Meets defined outcomes.	Follows a guided plan of action.	A limited range of tools, materials and/or processes are used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively.*	*Provides a limited range of customer/client services.*
2	meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately. *Quality and productivity are reasonably consistent. Works cooperatively to achieve team goals. Identifies and provides customer/client services.*	Meets defined outcomes.	Plans and solves problems with limited assistance.	Tools, materials and/or processes are selected and used appropriately.	*Quality and productivity are reasonably consistent.*	*Works cooperatively to achieve team goals.*	*Identifies and provides customer/client services.*
3	meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively. *Quality and productivity are consistent. Works cooperatively and contributes ideas and suggestions that enhance team effort. Analyzes and provides effective client/customer services.*	Meets defined outcomes.	Plans and solves problems in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently and effectively.	*Quality and productivity are consistent.*	*Works cooperatively and contributes ideas and suggestions that enhance team effort.*	*Analyzes and provides effective client/customer services.*

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S C A L E	**RUBRIC STATEMENT** **(included in assessment tool/statements in *italics* are optional)** ***The student:***	**IS TASK/ PROJECT COMPLETED?**	**PROBLEM SOLVING:** **STUDENT INITIATIVE VS TEACHER DIRECTION/ SUPPORT**	**USE OF TOOLS, MATERIALS, PROCESSES**	***STANDARDS OF QUALITY/ PRODUCTIVITY***	***TEAMWORK*** ***LEADERSHIP***	***SERVICE*** ***CLIENT/*** ***CUSTOMER***
4	exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence. *Quality, particularly details and finishes and productivity are consistent and exceed standards. Leads others to contribute team goals. Analyzes and provides effective client/customer services beyond expectations.*	Exceeds defined outcomes.	Plans and solves problems effectively and creatively in a self-directed manner.	Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.	*Quality, particularly details and finishes and productivity are consistent and exceed standards.*	*Leads others to contribute team goals.*	*Analyzes and provides effective client/customer services beyond expectations.*

ASSESSMENT FRAMEWORK: ISSUE ANALYSIS CTSISS

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning • accurately describes an issue on which people disagree • poses an important question regarding the issue • accesses basic in-school/community information sources regarding the issue • uses one or more information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining areas of disagreement • poses one or more thoughtful questions regarding the issue • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques	**Preparation and Planning** • accurately describes an issue on which people disagree, explaining specific causes of disagreement • poses thoughtful questions regarding the issue • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data
Analyzing Perspectives • clarifies different points of view regarding the issue; *e.g., social, economic, environmental* • states a position on the issue and logical reasons for adopting that position • states an opposing position on the issue and logical reasons for adopting that position • identifies sources of conflict among different positions • distinguishes between fact and fiction/opinion/theory	**Analyzing Perspectives** • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related* • states a position on the issue and logical reasons for adopting that position • states two or more opposing positions on the issue and logical reasons for adopting each position • describes interrelationships among different perspectives/points of view • determines accuracy/currency/reliability of information and ideas	**Analyzing Perspectives** • categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related, scientific, political* • states a position on the issue and insightful reasons for adopting that position • states three or more opposing positions on the issue and thoughtful reasons for adopting each position • analyzes interrelationships among different perspectives/points of view • recognizes underlying bias/assumptions/values in information and ideas
Collaboration and Teamwork • shares work appropriately among group members • respects the views of others	**Collaboration and Teamwork** • shares work appropriately among group members • respects and considers the views of others • negotiates solutions to problems	**Collaboration and Teamwork** • shares work appropriately among group members • respects and considers the views of others • negotiates with sensitivity solutions to problems
Evaluating Choices/Making Decisions • identifies useful alternatives regarding the issue • establishes criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate alternative based on established criteria • reflects on strengths/weaknesses of decisions by considering consequences • communicates information in a logical sequence to justify choices/decisions made	**Evaluating Choices/Making Decisions** • identifies important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences • communicates ideas in a logical sequence with supporting detail to justify choices/decisions made	**Evaluating Choices/Making Decisions** • describes in detail important and appropriate alternatives regarding the issue • establishes knowledge- and value-based criteria for assessing each alternative; *e.g., social, economic, environmental* • selects an appropriate and useful alternative by showing differences among choices • assesses strengths/weaknesses of decisions by considering consequences and implications • communicates thoughts/feelings/ideas clearly to justify choices/decisions made

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ISSUE ANALYSIS: Sustainable Energy Development ENM1050–1

TASK	OBSERVATION/RATING					
Preparation and Planning	4	3	2	1	0	N/A
Analyzing Perspectives	4	3	2	1	0	N/A
Collaboration and Teamwork	4	3	2	1	0	N/A
Evaluating Choices/Making Decisions	4	3	2	1	0	N/A

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not applicable

TASK CHECKLIST

The student:

Preparation and Planning

☐ accurately describes an issue on which people disagree regarding use of renewable/nonrenewable energy
☐ poses an important question regarding the impact of energy use on the environment and people who live there
☐ accesses basic in-school/community information sources regarding the issue
☐ uses one or more information-gathering techniques

Analyzing Perspectives

☐ clarifies different points of view regarding the issue:
e.g., social, economic, environmental
☐ states a position on the issue and logical reasons for adopting that position
☐ states an opposing position on the issue and logical reasons for adopting that position
☐ identifies sources of conflict among different positions
☐ distinguishes between fact and fiction/opinion/theory

Collaboration and Teamwork

☐ shares information and ideas appropriately among group members
☐ respects the views of others

Evaluating Choices/Making Decisions

☐ identifies potential options for dealing with the issues that further sustainable energy supply
☐ establishes criteria for assessing each alternative:
e.g., social, economic, environmental
☐ ______________________________
____
☐ develops a plan for dealing with the issue, based on established criteria, which furthers sustainable energy supply
☐ reflects on strengths/weaknesses of the plan by considering consequences; e.g.:
  – sustainable development
  – other quality of life factors
☐ ______________________________
____
☐ communicates information in a logical sequence to justify choices/decisions made
☐ ______________________________
____

REFLECTIONS/COMMENTS

ASSESSMENT FRAMEWORK: LAB INVESTIGATIONS

CTSLAB

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Management • prepares self for task • organizes and works in an orderly manner • carries out instructions accurately • uses time effectively	**Management** • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively • adheres to routine procedures	**Management** • prepares self for task • organizes and works in an orderly manner • interprets and carries out instructions accurately • plans and uses time effectively in a logical sequence • displays leadership in adhering to routine procedures • attempts to solve problems prior to requesting help
Teamwork • cooperates with group members • shares work appropriately among group members	**Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems	**Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication skills
Use of Equipment and Materials • selects and uses appropriate equipment/materials • follows safe procedures/techniques • weighs and measures accurately • returns clean equipment/materials to storage areas	**Use of Equipment and Materials** • selects and uses appropriate equipment/materials • models safe procedures/techniques • weighs and measures accurately • practises proper sanitation procedures • minimizes waste of materials • advises of potential hazards and necessary repairs	**Use of Equipment and Materials** • selects and uses equipment/materials independently • demonstrates concern for safe procedures/techniques • weighs and measures accurately and efficiently • practises proper sanitation procedures • minimizes waste of materials • anticipates potential hazards and emergency response
Investigative Techniques • gathers and applies information from at least one source • makes predictions that can be tested • sets up and conducts experiments to test a prediction • distinguishes between manipulated/responding variables • obtains results that can be used to determine if some aspect of the prediction is accurate • summarizes important experimental outcomes	**Investigative Techniques** • gathers and applies information from a variety of sources • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • identifies and explains manipulated/responding variables • obtains accurate results that confirm/reject the prediction • summarizes and applies experimental outcomes	**Investigative Techniques** • uses relevant information to explain observations • makes predictions that can be tested • plans, sets up and conducts experiments to test a prediction • analyzes relationships among manipulated/responding variables • obtains accurate results that confirm/reject prediction and answer related questions • summarizes, applies and evaluates experimental outcomes

FIELD INVESTIGATIONS: Soil, Air and Water Characteristics FOR3090–2

TASK	OBSERVATION/RATING					
Management	4	3	2	1	0	N/A
Teamwork	4	3	2	1	0	N/A
Equipment and Materials	4	3	2	1	0	N/A
Investigative Techniques	4	3	2	1	0	N/A

STANDARD IS 3 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not Applicable

TASK CHECKLIST

The student:

Management
☐ prepares self for task
☐ organizes and works in an orderly manner
☐ interprets and carries out instructions accurately
☐ plans and uses time effectively in a logical sequence
☐ displays leadership in adhering to routine procedures
☐ attempts to solve problems prior to requesting help

Teamwork
☐ cooperates with group members
☐ shares work appropriately among group members
☐ negotiates with sensitivity solutions to problems
☐ displays effective communication skills

Equipment and Materials
☐ independently selects and uses equipment/ materials
☐ demonstrates concern for safe procedures/techniques
☐ measures accurately and efficiently
☐ practises proper sanitation procedures
☐ minimizes waste of materials
☐ anticipates potential hazards and emergency response

Investigative Techniques
☐ identifies two or more local soil types using soil triangle and hand texturing techniques
☐ makes predictions that can be tested regarding the effects of:
  - soil pH on the growth of trees
  - temperature on the growth of trees
  - water quantity on the growth of trees
☐ plans and conducts field investigations to test each predictions
☐ uses relevant information to explain observations regarding the effects of soil pH, temperature and water quantity on the growth of trees
☐ ____________________
☐ analyzes relationships among manipulated/responding variables
☐ obtains accurate results that confirm/reject each prediction and answer related questions
☐ summarizes, applies and evaluates observations and experimental outcomes
☐ ____________________

REFLECTIONS/COMMENTS:

ASSESSMENT FRAMEWORK: NEGOTIATION AND DEBATE

CTSNEG

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning	**Preparation and Planning**	**Preparation and Planning**
• accurately describes an issue on which people disagree	• accurately describes an issue on which people disagree, explaining areas of disagreement	• accurately describes an issue on which people disagree, explaining specific causes of disagreement
• poses an important question regarding the issue	• poses one or more thoughtful questions regarding the issue	• poses thoughtful questions regarding the issue
• accesses basic in-school/community information sources regarding the issue	• accesses a range of relevant in-school/community resources	• accesses a range of relevant information sources and recognizes when additional information is required
• uses one or more information-gathering techniques	• uses a range of information-gathering techniques	• demonstrates resourcefulness in collecting data
Analyzing Perspectives	**Analyzing Perspectives**	**Analyzing Perspectives**
• states a position on the issue and logical reasons for adopting that position	• states a position on the issue and logical reasons for adopting that position	• states a position on the issue and insightful reasons for adopting that position
• explains why the issue is important by presenting examples of possible consequences	• explains why the issue is important by presenting examples of possible consequences	• explains why the issue is important by presenting examples of possible consequences and implications
• clarifies different points of view regarding the issue; *e.g., social, economic, environmental*	• categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related*	• categorizes different points of view regarding the issue; *e.g., cultural, ethical, economic, environmental, health-related, scientific, political*
• distinguishes between fact and fiction/opinion/theory	• determines accuracy/currency/reliability of information and ideas	• recognizes underlying bias/assumptions/values in information and ideas
Collaboration and Teamwork	**Collaboration and Teamwork**	**Collaboration and Teamwork**
• works with a range of peer members	• works with a range of peer members	• works with a wide range of peer members
• shares information/opinions/suggestions through group discussion	• shares information/opinions/suggestions, maintaining a balance between speaking and listening	• shares information/opinions/suggestions, maintaining a balance between speaking and listening
• listens to and respects the views of others	• listens to and respects the views of others, requesting clarification as necessary from other group members	• listens to and respects the views of others, requesting clarification as necessary from other group members
Negotiating and Debating	**Negotiating and Debating**	**Negotiating and Debating**
• presents a convincing argument in logical sequence supporting a position adopted on the issue	• presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance	• presents a convincing argument in logical sequence supporting a position adopted, conveying points in order of importance and backing each with sound evidence
• provides a relevant response to opposing arguments	• provides a relevant and convincing response to opposing arguments	• provides a relevant and convincing rebuttal to opposing arguments
• speaks clearly so the argument can be understood	• speaks clearly without hesitation so the argument can be understood	• speaks clearly without hesitation so the argument can be understood by all listeners
• establishes a shared understanding of key alternatives and consequences relevant to the issue	• negotiates a shared agreement on preferred alternatives relevant to the issue	• negotiates a shared agreement on preferred alternatives by resolving divergent points of view

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NEGOTIATION AND DEBATE (Introductory) ENMNEG–1

TASK	OBSERVATION/RATING					
Preparation and Planning	4	3	2	1	0	N/A
Analyzing Perspectives	4	3	2	1	0	N/A
Collaboration and Teamwork	4	3	2	1	0	N/A
Negotiating and Debating	4	3	2	1	0	N/A

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

The student:

4 exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.

3 meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.

2 meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.

1 meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.

0 has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

N/A Not applicable

TASK CHECKLIST

The student:

Preparation and Planning

☐ accurately describes an issue on which people disagree
☐ poses an important question regarding the issue
☐ accesses basic in-school/community information sources regarding the issue
☐ uses one or more information-gathering techniques

Analyzing Perspectives

☐ states a position on the issue and logical reasons for adopting that position
☐ explains why the issue is important by presenting examples of possible consequences
☐ clarifies different points of view regarding the issue: *e.g., social, economic, environmental*
☐ distinguishes between fact and fiction/ opinion/theory

Collaboration and Teamwork

☐ works with a range of peer members
☐ shares information/opinions/suggestions through group discussion
☐ listens to and respects the views of others

Negotiating and Debating

☐ presents a convincing argument in logical sequence supporting a position adopted on the issue
☐ provides a relevant response to opposing arguments
☐ speaks clearly so the argument can be understood
☐ establishes a shared understanding of key alternatives and consequences relevant to the issue

REFLECTIONS/COMMENTS:

ASSESSMENT FRAMEWORK: PRESENTATIONS/REPORTS CTSPRE

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning	**Preparation and Planning**	**Preparation and Planning**
• sets goals and follows instructions accurately	• sets goals and describes steps to achieve them	• sets goals and describes steps to achieve them
• responds to directed questions and follows necessary steps to find answers	• uses personal initiative to formulate questions and find answers	• uses personal initiative to formulate questions and find answers
• accesses basic in-school/community information sources	• accesses a range of relevant in-school/community resources	• accesses a range of relevant information sources and recognizes when additional information is required
• interprets and organizes information into a logical sequence	• interprets, organizes and combines information into a logical sequence	• interprets, organizes and combines information in creative and thoughtful ways
• records information accurately, using correct technical terms	• records information accurately with appropriate supporting detail and using correct technical terms	• records information accurately, using appropriate technical terms and supporting detail
• uses time effectively	• plans and uses time effectively	• plans and uses time effectively, prioritizing tasks on a consistent basis
	• gathers and responds to feedback regarding approach to task and project status	• assesses and refines approach to task and project status based on feedback and reflection
Presentation	**Presentation**	**Presentation**
• demonstrates effective use of at least one medium of communication:	• demonstrates effective use of at least two communication media:	• demonstrates effective use of a variety of communication media:
e.g., *Written*: *spelling, punctuation, grammar, basic format*	*e.g.,* *Written*: *spelling, punctuation, grammar, format (formal/informal)*	*e.g.,* *Written*: *spelling, punctuation, grammar, format (formal/informal, technical/literary)*
Oral: *voice projection, body language*	*Oral*: *voice projection, body language, appearance*	*Oral*: *voice projection, body language, appearance, enthusiasm, evidence of prior practice*
Audio-Visual: *techniques, tools*	*Audio-Visual*: *techniques, tools, clarity*	*Audio-Visual*: *techniques, tools, clarity, speed and pacing*
• uses correct grammatical convention and technical terms through proofreading/editing	• maintains acceptable grammatical and technical standards through proofreading and editing	• maintains acceptable grammatical and technical standards through proofreading and editing
• provides an introduction that describes the purpose of the project	• provides an introduction that describes the purpose and scope of the project	• provides an introduction that describes the purpose and scope of the project
• communicates information in a logical sequence	• communicates ideas into a logical sequence with sufficient supporting detail	• communicates thoughts/feelings/ideas clearly to justify or challenge a position
• states a conclusion based on a summary of facts	• states a conclusion by synthesizing the information gathered	• states a conclusion by analyzing and synthesizing the information gathered
• provides a reference list of three or more basic information sources	• provides a reference list that includes five or more relevant information sources	• gives evidence of adequate research through a reference list including seven or more relevant information sources

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PRESENTATIONS/REPORTS: MANAGEMENT AND MARKETING PROJECTS

MAM1010–1

STUDENT NAME(S)

Task	Observations Of Student					
Planning and Presentation	4	3	2	1	0	N/A
Management Project	4	3	2	1	0	N/A
Marketing Project	4	3	2	1	0	N/A
Retailing Presentation	4	3	2	1	0	N/A
Retail Merchandising	4	3	2	1	0	N/A
Presenting/Reporting	4	3	2	1	0	N/A

STANDARD IS 1 IN EACH APPLICABLE TASK

Rating Scale

4	Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
3	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
2	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
1	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
0	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

TASK CHECKLIST - criteria for introductory level

The student:

☐ **Preparation and Planning**
- sets goals and follows instructions accurately
- responds to directed questions and follows necessary steps to find answers
- accesses basic in-school/community information sources
- interprets and organizes information into a logical sequence
- records information accurately using correct technical terms
- uses time effectively

MANAGEMENT PROJECT

Content:

☐ relates management concepts of planning, organizing, leading and monitoring to:
- personal and family life
- local organizations including schools
- local business, large and small

MARKETING PROJECT

Content:

☐ lists general characteristics and types of decisions made for each part of the marketing mix including:
- product
- price
- promotion
- place
- consumer
- competition

☐ designs a prototype product

or

☐ selects an existing product

☐ designs and carries out a mini market survey of product

☐ recommends marketing decisions regarding product

☐ shows the connections between assigned task and the marketing decisions made every day in the market place.

RETAILING PRESENTATION

Content:

☐ explains the role of retailing in the marketplace

☐ outlines the evolution of retailing

☐ discusses the role of technology in retailing

☐ describes the major functions of retailing:
- buying
- selling
- merchandising

RESPONSES TO RETAIL MERCHANDISING STRATEGIES

Content:

☐ identifies and analyzes a variety of retail merchandising strategies related to:
- product
- price
- place
- promotion
- service

☐ **Presenting/Reporting**
- demonstrates effective use of one or more communication media

  e.g., Written: spelling, punctuation, grammar basic format

  Oral: voice projection, body language

  Audio-Visual: techniques, tools
- uses correct grammatical convention and technical terms through proof-reading/editing
- provides an introduction that describes the purpose of the project
- communicates information in a logical sequence
- states a conclusion based on a summary of facts
- provides a reference list of 3 or more basic information sources (e.g. books, interviews, videos, etc.).

ASSESSMENT FRAMEWORK: RESEARCH PROCESS CTSRES

INTRODUCTORY	INTERMEDIATE	ADVANCED
The student:	*The student:*	*The student:*
Preparation and Planning • sets goals and follows instructions accurately • adheres to established timelines • responds to directed questions and follows necessary steps to find answers • uses time effectively	**Preparation and Planning** • sets goals and establishes steps to achieve them • creates and adheres to useful timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively	**Preparation and Planning** • sets clear goals and establishes steps to achieve them • creates and adheres to detailed timelines • uses personal initiative to formulate questions and find answers • plans and uses time effectively, prioritizing tasks on a consistent basis
Information Gathering and Processing • accesses basic in-school/community information sources • uses one or more information-gathering techniques • interprets and organizes information in a logical sequence • records information accurately, using correct technical terms • distinguishes between fact and fiction/opinion/theory • responds to feedback when current approach is not working	**Information Gathering and Processing** • accesses a range of relevant in-school/community resources • uses a range of information-gathering techniques • interprets, organizes and combines information into a logical sequence • records information accurately with appropriate supporting detail and using correct technical terms • determines accuracy/currency/reliability of information sources • gathers and responds to feedback regarding approach to the task	**Information Gathering and Processing** • accesses a range of relevant information sources and recognizes when additional information is required • demonstrates resourcefulness in collecting data • interprets, organizes and combines information in creative and thoughtful ways • records information accurately with appropriate supporting detail and using correct technical terms • recognizes underlying bias/assumptions/values in information sources • assesses and refines approach to the task and project status based on feedback and reflection
Collaboration and Teamwork • cooperates with group members • shares work appropriately among group members	**Collaboration and Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates solutions to problems	**Collaboration and Teamwork** • cooperates with group members • shares work appropriately among group members • negotiates with sensitivity solutions to problems • displays effective communication and leadership skills
Information Sharing • demonstrates effective use of one or more communication media; *e.g., written, oral, audio-visual* • communicates information in a logical sequence • uses correct grammatical convention and technical terms • cites three or more basic information sources	**Information Sharing** • demonstrates effective use of two or more communication media; *e.g., written, oral, audio-visual* • communicates ideas in a logical sequence with sufficient supporting detail • maintains acceptable grammatical and technical standards • cites five or more relevant information sources	**Information Sharing** • demonstrates effective use of a variety of communication media; *e.g., written, oral, audio-visual* • communicates thoughts/feelings/ideas clearly to justify or challenge a position • maintains acceptable grammatical and technical standards • gives evidence of adequate information gathering by citing seven or more relevant information sources

RESEARCH PROCESS: RETAIL POLICIES AND PROCEDURES MAM2040–1

Student(s) ____________________

Task	Observations of Student
Preparation and Planning	4 3 2 1 0 N/A
Information Gathering and Processing	4 3 2 1 0 N/A
Content	4 3 2 1 0 N/A
Collaboration and Teamwork	4 3 2 1 0 N/A
Information Sharing	4 3 2 1 0 N/A

STANDARD IS 2 IN EACH APPLICABLE TASK

Rating Scale

4	Exceeds defined outcomes. Plans and solves problems effectively and creatively in a self-directed manner. Tools, materials and/or processes are selected and used efficiently, effectively and with confidence.
3	Meets defined outcomes. Plans and solves problems in a self-directed manner. Tools, materials and/or processes are selected and used efficiently and effectively.
2	Meets defined outcomes. Plans and solves problems with limited assistance. Tools, materials and/or processes are selected and used appropriately.
1	Meets defined outcomes. Follows a guided plan of action. A limited range of tools, materials and/or processes are used appropriately.
0	Has not completed defined outcomes. Tools, materials and/or processes are used inappropriately.

TASK CHECKLIST

The student

☐ **Preparation and Planning**
- sets goals and establishes steps to achieve them
- creates and adheres to useful timelines
- uses personal initiative to formulate questions and find answers
- plans and uses time effectively

☐ **Information Gathering and Processing**
- accesses a range of relevant in-school/community resources
- uses a range of information-gathering techniques
- interprets, organizes and combines information into a logical sequence
- records information accurately with appropriate supporting detail and using correct technical terms
- determines accuracy/currency/reliability of information sources
- gathers and responds to feedback regarding approach to the task

Content

☐ researches and reports on a particular store's policies and procedures including:
  - sales and service policies
  - credit and collection
  - store security
  - human resources
  - recordkeeping

☐ **Collaboration and Teamwork**
- cooperates with group members
- shares work appropriately among group members
- negotiates solutions to problems

☐ **Information Sharing**
- demonstrates effective use of two or more communication media:
  e.g., written, oral, audio-visual
- communicates ideas in a logical sequence with sufficient supporting detail
- maintains acceptable grammatical and technical standards
- cites five or more relevant information sources

REFLECTIONS/COMMENTS:

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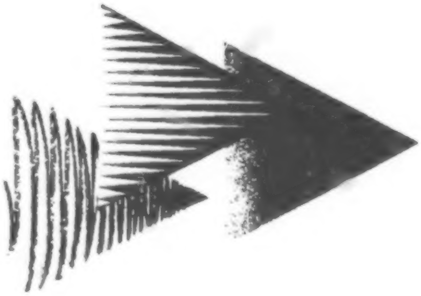

CAREER AND TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 13:

STANDARD HEALTH AND SAFETY PRACTICES FOR CTS

August 1997 (Interim)

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The information and recommendations provided in this document are general in nature and do not in any way replace the expert advice required for specific circumstances.

Questions or comments about this Manual for Administrators, Counsellors and Teachers are welcomed and should be directed to:

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STANDARD HEALTH and SAFETY PRACTICES for CTS

PURPOSE

This service document has been designed to assist teachers and school system administrators to:

- understand how safety is addressed in the CTS curriculum
- provide a quick reference for identifying key issues, related legislation and sources of support should they wish to:
  - review present safety practices as applied within CTS learning environments, both on- and off-campus
  - develop and maintain an effective health and safety program targeting the delivery of CTS
- respond to frequently asked questions about safety in CTS.

Safety is an attitude, a frame of mind. It is the constant attention to and total awareness of one's environment and actions, all day, every day.

This document may help teacher preparation and professional upgrading programs and those designing or upgrading learning environments in CTS.

ORGANIZATION

The information included in this document focuses on the first two of the three components of an effective health and safety program:

PRE-CONTACT

CONTACT

POST-CONTACT

1. *pre-contact* — what is done to prevent or reduce accidents (safety program, safe facilities, ensuring safe practices)
2. *contact*—what is done when an accident occurs to reduce the injury to the individual(s) affected
3. *post contact* — what is done to investigate the accident and determine corrective action.

Refer to Attachment 1: Components of a Health and Safety Program

RATIONALE

CTS is an experiential program and as such, safety is a particularly important issue. In CTS, students learn by doing. They work with various technologies as they produce a product or demonstrate a process or technique. As students learn to manage themselves and the tools they work with, they develop an attitude toward personal safety and the safety of others which will transfer to their personal and work life as they move into adult roles.

Effective health and safety programs and practices in CTS offer a sound present and future investment.

Many effective health and safety programs are underway in Alberta schools. Health and safety is a broader issue than CTS, and it is a consideration in all aspects of schooling. Safety programs and practices that are in place within our schools support the implementation of CTS, as well as other school programs such as science and physical education.

CTS has a more flexible curriculum structure, and more extensive delivery options, both on-campus and off-campus, and it may involve teachers in the delivery process who may not have had formal training in safety practices.

Curriculum structure — the CTS curriculum addresses safety in a somewhat different way than was done in the former practical arts programs. The concept of safety within the curriculum is restructured and expanded.

What causes accidents?

*- 80% unsafe **acts***
*- 20% unsafe **conditions.***

Program Delivery — this document will provide helpful suggestions regarding how to deliver CTS in as safe a learning environment as possible, including recommendations regarding:

- facility and equipment
- instructional planning
- classroom management
- due diligence.

Safety awareness and practice must be developed through formal instruction and by integrating safety into daily learning experiences. A successful CTS health and safety program requires the cooperation of students and the active understanding and leadership of teachers, administrators and school boards.

"It is not enough to become familiar with the regulations. Teachers and administrators must continually assess and alter the teacher/learning environment to reflect the latest contemporary safety, health, and environmental practices."

The New ABC's of Safety, 1991

As employers, school boards provide their employees and those in their care with a place to work and learn that complies with all applicable federal, provincial and municipal health and safety and environmental regulations. In addition, school boards also ensure that their employees are:

- aware of their responsibilities
- aware of the hazards associated with their work
- able to carry out their work safely
- trained in measures for their own safety.

Health and safety policies and programs can be considered from a variety of perspectives:

Personal:

- positive impact (opportunity) — development of an individual's confidence in understanding how to act in a way to reduce accidents, how to respond efficiently and effectively if an accident should occur and to understand rights and responsibilities related to ensuring the safety of that person and others

- negative impact (challenge) — the adjustment to an individual's physical, psychological and social well-being, both present and future, required when an accident occurs.

Professional:

- positive impact (opportunity) — development of a team that is committed to ensuring the health and safety of themselves and others. This is particularly challenging for teachers who are responsible for safe practices and of motivating and monitoring large groups of young people to demonstrate safe practices as they learn and to develop a lifelong commitment to health and safety
- negative impact (challenge) — the challenge for teachers to manage many variables: what students know, the tools they need to learn to use and their interaction with others.

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Economic

- positive impact (opportunity) — more productive working and living environments, opportunity to reallocate resources from damage control to new initiatives that can stimulate greater economic growth

- negative impact (challenge) — the direct costs to the individual and the workplace in accident costs (medical, time lost, etc.) as well as indirect, long-term costs to the individual, family and society in reduced potential and opportunity.

I HEALTH AND SAFETY IN THE CTS CURRICULUM

Safety and risk management are integrated within the CTS program in four ways:

- as a *basic competency* that students should demonstrate within each module
- as a *module or specific learner expectation* in selected strands and modules
- as three *discrete modules* within the Career Transitions strand
- as a *module parameter,* relating to the equipment and procedures to be maintained in labs involving power equipment or in situations where students may be involved in field trips in strands such as forestry and wildlife.

A. Health and Safety as a Basic Competency

Students will improve their ability to demonstrate the basic competencies in each of the CTS strands and modules. Students' performance and growth in managing themselves and working with others can be assessed through observations involving the student, teacher, peers and others as they complete the requirements for a module.

Under "Managing Responsibility," students are expected to identify and promote safety practices, both for themselves and others. Teachers are expected to monitor and assess these behaviours in all CTS modules.

B. Safety as Module and Specific Learner Expectations

In the following strands, specific learner expectations related to safety form part of the content that is formally taught and tested for many modules.

- Agriculture
- Career Transitions
- Communication Technology
- Community Health
- Construction Technologies
- Design Studies
- Electro-Technologies
- Energy & Mines
- Fabrication Studies
- Fashion Studies
- Foods
- Forestry
- Information Processing
- Logistics
- Management & Marketing
- Mechanics
- Tourism Studies
- Wildlife

C. Safety Modules in the Career Transitions Strand

The following three modules included in the Career Transitions strand focus on building students' competency in workplace safety procedures:

- CTR1210: Personal Safety Management
- CTR2210: Workplace Safety Practices
- CTR3210: Safety Management Systems.

D. Safety as a Module Parameter

Module parameters describe the elements that need to be in place to support effective learning in a module, including facilities and equipment and instructional qualifications.

In some modules, the competencies that the students are developing may involve a higher risk factor, possibly because of the type of equipment (e.g., power tools) or the kind of performance (e.g., doing customer work). In this event, those involved in delivering the program may require additional training in safety procedures.

For further information about these module parameters, refer to each module as outlined in the *Guides to Standards and Implementation* or the *CTS Manual for Administrators, Counsellors and Teachers*, Appendix 6: CTS Module Parameters.

II HEALTH AND SAFETY IN THE CTS LEARNING ENVIRONMENT

Safety is knowing what is going on; knowing what can injure anyone or anything; knowing how to prevent that injury, and then taking action to prevent that injury.

A. Pre-Contact: Avoiding Accidents and Ensuring Health

1. Risk Management

Risk management involves the identification, evaluation and control of health and safety hazards. Under provincial legislation, administration and teachers are required to take steps to recognize hazards and reduce them to a minimum.

a. Hazard Recognition

A health and safety hazard can be any condition or practice that has the potential to cause an illness, personal injury or damage to property. There are four common types of health and safety hazards found in CTS classrooms as illustrated in the following chart.

Chart No. 1: Types of Health and Safety Hazards

Type of Hazard	Generally caused by:
Biological • bacteria • moulds • viruses • parasites	poor sanitation and housekeeping practices, contact with body fluids and inadequately maintained air conditioning and heating systems
Chemical • flammable • toxic • reactive • corrosive	a chemical in the form of a solid, liquid, vapour, mist or fume that can cause harm to a body organ through ingestion, absorption, inhalation or injection
Ergonomic • excessive force • excessive repetition • improper posture • incorrect lighting	muscle strains/sprains, inadequate lighting and poor workstation design
Physical • cuts/bruises • fractures • burns/frost bite • electric shock • hearing loss	excessive energy related to falling/flying objects and extreme pressure, temperatures, electrical current, radiation and noise
Other	work related stress and personal issues.

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The following chart identifies the CTS strands that can involve higher risk.

Chart No. 2: CTS Strands Involving Health and Safety Issues

CTS Strand	Biological	Chemical	Ergonomic	Physical	Other
Agriculture	X	X	X	X	
*Career Transitions					
Communication Technology		X	X		
Community Health	X				X
Construction Technologies		X	X	X	
Cosmetology Studies		X	X		
*Design Studies			X		
Electro-Technologies		X	X	X	
Energy and Mines	X	X	X	X	
Enterprise & Innovation					
Fabrication Studies		X	X	X	
Fashion Studies			X	X	
Financial Management					
Foods		X	X	X	
Forestry	X	X	X	X	
Information Processing			X		X
Legal Studies					
Logistics			X	X	
Management and Marketing				X	

* *Will vary according to types of program and off-campus experience.*

See Attachment 2 for more detailed information as to the degree and type of risk that should be monitored in the above strands.

Hazard Identification

Hazards can be identified through:

- formal and informal lab inspections
- analysis of accidents or near-misses
- task analysis
- product labels and information sheets
- equipment and tool manufacturers' recommendations
- concern expressed by students when involved in a specific task.

As a matter of policy, every student should be taught to recognize and report hazards associated with his or her work and take the necessary precautions to prevent an accident from occurring.

One of the most effective ways of identifying unsafe conditions is through regular classroom/lab inspections. These inspections help to identify:

- housekeeping concerns
- equipment problems
- issues related to lighting, heating and ventilation
- changes in procedures that may have a negative impact on health and safety
- corrections that should have already been remedied.

Refer to Attachment 3 for sample facility and program check lists.

When there are fewer unsafe acts and conditions there are fewer accidents.

Accidents are by their very nature disruptive and may or may not cause injury or damage to property. Students may not report incidences where no injury or damage to property occurs. However, these near-misses add to the chance of a serious accident in the future and therefore should be monitored and corrected on an on-going basis.

The analysis of lab procedures is a process that examines the interaction between the students, the environment in which they work, equipment and materials they use. The results of this assessment enable teachers to:

- determine the level of knowledge and skills that a student requires to safely complete a given task, process or operation
- identify substandard acts and conditions and determine effective control measures to:
  - modify student behaviour
  - modify lab/shop conditions or procedures.

Teacher may be at greater risk than students because of increased exposure.

b. Hazard Evaluation:

Hazard evaluation is the process used to prioritize an identified hazard to ensure that appropriate action will be taken. Hazards that are deemed to be extremely dangerous should be dealt with first. Consideration should be given to:

- the short- and long-term effects on teachers and students
- ways to remove the hazard
- methods that will protect persons from harm
- reducing or eliminating a person's exposure time.

c. Hazard Control

Besides being able to recognize and evaluate hazards, risks can be further minimized through hazard control.

Hazard control can be accomplished in the classroom through effective:

- administrative controls
- engineering controls
- personal protective equipment.

• Administrative Controls

Administrative controls deal primarily with policies and regulations, classroom supervision and instruction. In a well-managed classroom the teacher's efforts are directed towards:

- providing adequate instruction on lab routines, job procedures and equipment operation
- identifying and establishing sanitary practices
- planning safe event sequences
- scheduling work to avoid overcrowding
- identifying and securing materials that are less toxic and harmful to the student and environment
- locating and ordering equipment that meets or exceeds accepted standards of safety.

• Engineering Controls

Engineering controls focus on systems that physically remove hazardous materials or provide protection from a known hazard. These controls include such items as storage cabinets, machine guards and ventilation systems.

Ventilation

In accordance with government regulations, where there exists a reasonable possibility that a health or safety hazard exists from the production or dissemination of an airborne contaminant, ventilation shall be in place such that these hazards are controlled.

In determining whether a ventilation system is needed, the following points should be considered:

- concentrations of the airborne contaminants in comparison with the maximum allowable limits set by Alberta Labour, Occupational Health and Safety (Chemical Hazards Regulation)
- physical, chemical and toxicological properties of the contaminants
- flammability and explosivity of the contaminants
- location of the students or staff in relation to the sources
- oxygen content of the air
- duration of the exposure of the workers.
- sources and concentrations of the contaminants; e.g., dust and fumes.

Dust and Fume Extraction

Dust and fume extraction equipment should be engineered to operate with the least amount of noise and vibration.

Dust and fume extraction should take place as close to the source as is possible to avoid spreading the contaminates or fumes throughout the work environment. Processes that typically require dust/fume extraction include:

- cooking
- foundry
- welding and soldering
- woodworking.

Machine Guards

Well-engineered guards should not interfere with the safe operation of the equipment.

Guards are installed on equipment to protect the operator from rotating parts, flying chips, sparks, high temperatures and operating points. At no time should fixed guards be removed or mechanisms locked out. Types of guards and guarding mechanisms include:

- complete enclosures around belts and pulleys
- movable guards as found on table saw or jointer
- fixed guard around a grindstone
- covers in place at the point of operation
- interlocking devices requiring both hands to be used as in the operation of a paper cutter
- automatic shut off used in connection with a washer/ dryer lid or door and CNC lathe/mill cover.

- **Personal Protective Equipment**

Often the only practical way to minimize the risk of illnesses or injury is to use Personal Protective Equipment (PPE). Since this equipment is the last defence, it should not take the place of control techniques such as substituting a less hazardous product for a more hazardous one, exhausting dangerous fumes, extracting dust particles and guarding equipment. Points to consider when selecting and using personal protective equipment include:

- matching the type and design features of the equipment with the type and extent of the hazard
- identifying equipment that does not interfere with the student's performance
- using equipment that is approved and easily maintained.

Clothing

Clothing is often the first line of defence against injury. Many lab processes require students to wear aprons, smocks or coveralls over their regular clothing. Where there is the possibility of becoming caught in moving parts or exposure to fire, students **should not** be permitted to wear:

- loose fitting or torn clothing
- garments made from flammable materials
- exposed jewelry
- long loose hair.

Eye/Face Protection

For more information, refer to Alberta Labour "Eye Injury Prevention in Industry," 1994.

Any operation that presents a risk of injury to the eyes or face require the use of approved eye/face protection equipment. This PPE is designed to protect individuals against:

- flying objects, sparks and particles
- splashing liquids and molten metal
- intense heat
- ultraviolet, infrared and visible radiation.

A variety of eye and face protection devices are available. They include:

- safety glasses equipped with side shields to offer protection from impact
- goggles that are vented to protect the eyes and a portion of the face

- goggles that are non-vented to protect against impact and chemical splashes
- welding goggles to protect against radiation and impact
- welding helmets to protect the eyes and face from radiation and impact
- face shields to protect the whole face; these should also be supplemented with safety glasses.

Hearing Protection

For more information refer to CSA Standards "Hearing Protection," Z94.2-94.

Noise from some operations may cause hearing loss.

Students and teachers should not be exposed to a sound level that exceeds 85 dB on average for an eight-hour day unless some form of hearing protection is used. It is at higher decibel levels (85 - 90 and above) that the chances of noise-induced hearing loss begins to increase. Examples of noise levels produced by common tools and the occupation exposure limits are outlined in the chart below.

Noise Levels*

Machine	Decibel Level	Max Hrs./Day of Exposure
Bandsaw	95	2
Chain saw	100	1
Circular saw	105	1/2
Dust collector	95	2
Jointer	90	4
Lawn mower	95	2
Metal lathe	80	16
Router	105	1/2
Thickness planer	105	1/2

*Actual levels will vary according to the design of the equipment. For example, belt driven equipment tends to be less noisy than gear driven.

To reduce or eliminate the risk of injury owing to sudden or continuous noise levels, the appropriate precautions should be taken, either by using hearing protection or limiting exposure time. The most common types of hearing protection used in CTS programs are earplugs and earmuffs.

Head Protection

For more information, refer to CSA Standards "Industrial Protective Headwear," Z94.1-92.

On many job sites and activities, safety headwear is required to protect the head from falling objects, bumps, splashes or energized objects. Headwear must meet CSA requirements and job site recommendations. It should be noted that bump caps are not considered to be a helmet and can only be used where there is little risk from falling objects.

Foot Protection

Safety footwear is designed to protect against impact, compression and puncture injuries. Safety footwear can be purchased in a variety of styles and grades indicated by coloured tags and symbols. The colour of the tag indicates the amount of resistance the toe will support against different weights dropped from varying heights. In construction, a green triangle is recommended in conjunction with a high cut boot that gives ankle support.

Hand Protection

Consult the Material Safety Data Sheet for Recommended Protection When Handling Hazardous Materials.

Hands often need to be protected from heat/cold, abrasion, chemicals and electrical shocks. PPE is available for each of these hazards, including:

- finger guards
- thimbles
- hand pads
- mitts
- gloves.

If gloves or other devices are necessary, they should fit properly and do the job required. Note, in some instances, that gloves or other forms of hand protection are not recommended particularly around moving machinery since the glove can get caught and pull the worker into the moving parts.

Respiratory Protection

There are two major categories of respirators. The most common type to be found in a CTS classroom is the Air Purifying Respirator (APR) that is designed to remove dust, fume and mist particles. APRs are further divided into disposable and reusable types. The second, more specialized category is the atmosphere supply respirator, which includes Self-Contained Breathing Apparatus (SCBA) used, for example, in auto body painting.

Remember, APR is only as good as its seal and its ability to filter out the contaminates for which it was designed.

The choice of respirator depends on the type of hazard and the degree of use. For example:

- disposable fiber respirators are simple types of air purifiers that cover the nose and mouth. They can be used in conjunction with low levels of dust, mist and fumes. Once the paper fibers have become loaded the filter must be disposed of
- reusable half and full face respirators are usually made of rubber and protect against certain dust, mists, gases and vapours using disposable or rechargeable cartridges.

In all cases it is important to maintain the equipment and ensure a proper seal around the face when in use.

Workplace Hazardous Materials Information System

- **Chemical Management**

The following is a brief overview of Workplace Hazardous Materials Information System (WHMIS) and how it applies to schools. It is not meant to be a comprehensive description of WHMIS. Questions pertaining to specific details regarding WHMIS should be directed to the school board's occupational Health & Safety Department, or to Alberta Labour.

WHMIS is a system to ensure that "workers" are provided with complete and accurate information regarding hazardous products that they use, and to ensure that the information is used to provide safe working conditions. It is a Canada-wide system that regulates suppliers, employers and workers.

Suppliers must inform purchasers of the properties, hazards, and procedures for safe use of the hazardous materials they are buying.

Employers and workers must become knowledgeable about this hazard information and must use the information to ensure safe use of the materials, under normal and emergency conditions.

Why WHMIS?

WHMIS is intended to solve several problems that currently exist at some work sites, including schools. These problems include:

- unlabelled or inadequately labelled substances
- inadequate information on hazards and precautions relating to hazardous materials
- lack of awareness by employers and workers about the materials they use
- improper use of hazardous materials.

These problems are resulting in a unacceptable incidence of injuries, illnesses, and allergies resulting from exposure to hazardous substances, and the associated loss of work time, money and quality of life.

Legal Status of WHMIS

WHMIS is a federal law supplemented by provincial laws. Therefore, the requirements of WHMIS **must** be followed.

School administrators and teachers, as well as other paid workers in the school, are "designated occupations" under the legislation. Therefore, literally all workers in the school are responsible for WHMIS requirements in their work. (Although "student" is not a designated occupation in legislation, it is important that students become knowledgeable and follow WHMIS provisions.)

Within a school, WHMIS is pertinent to:

- school administrators
- teachers (especially in science, CTS and art)
- aides and assistants in those subject areas
- cleaning and facility operations staff
- secretarial and clerical staff
- students.

Elements of WHMIS

WHMIS is composed of three key elements:

1. Labels
2. Material Safety Data Sheet (MSDS)
3. Worker Education.

Labels

There are two different types of WHMIS labels that can be attached to a controlled product: the Supplier Label and the Workplace Label.

The Supplier Label contains information regarding the product's name, health risks, safe handling procedures, first aid measures, and the manufacturer or supplier identity. The Supplier Label also must display the applicable WHMIS symbols and must make reference to the product's Material Safety Data Sheet. All original containers of controlled products from manufacturers or suppliers must have this information.

Consumer Products

Many of the products used in a school are "Consumer Products" and are partially exempt from WHMIS requirements. As a result, these products do not require Workplace Labels provided their original labels are legible, and they are stored and used in their original containers. However, once they have been decanted or their original labels have been replaced with workplace labels, they become WHMIS-controlled and must meet all labelling and Material Safety Data Sheet requirements.

Material Safety Data Sheets

A Material Safety Data Sheet (MSDS) for each controlled product that is used or available for use must be readily accessible at the work site. The only exception applies to consumer products in their original containers with their original labels intact. However, since consumer products are often decanted from their original containers, MSDS for these products should also be readily available.

The MSDS contains nine sections of important information:

1. Product Identification and Use
2. Hazardous Ingredients
3. Physical Data
4. Fire & Explosion Data
5. Reactivity Data
6. Toxicological Data
7. Preventive Measures
8. First Aid Measures
9. Preparation Date.

The MSDS is NOT:

- all the information needed for safe use of a product in every situation
- a document only to be read and filed away.

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A binder of MSDSs should be maintained and located in the area where the products are used. MSDSs should be reviewed before using a product or instructing anyone else in its use. An MSDS cannot be more than three years old (from indicated preparation date on MSDS). Any MSDS older than this is invalid and must be replaced as soon as possible with an updated version. Updated MSDS are usually readily available from the supplier. A WHMIS-controlled product should not be used if there is no MSDS on-site.

Worker Education

The employer must ensure that each worker is provided (or has) whatever amount of education and training is necessary to ensure safe use of each controlled product under normal and emergency conditions. Thus, personnel who use or come into contact with WHMIS controlled products and Transportation of Dangerous Goods, as outlined below, must be identified and their training needs determined. Initial and regular refresher training must be provided. The training given should also be regularly evaluated for relevance and effectiveness.

- **Transportation of Dangerous Goods (TDG)**

"Dangerous goods" are defined here as potentially hazardous materials that are explosive, flammable, poisonous, infectious, radioactive or corrosive. The *Transportation of Dangerous Goods Act* exists to protect people, the environment, or property when these goods are being transported by road, rail, sea or air (TDG applies to transport only. It does not apply within the workplace — only WHMIS does). Shippers, carriers and receivers are all responsible for ensuring that shipments of dangerous goods comply with federal and provincial regulations as well as municipal bylaws.

TDG Regulations

The *Transportation of Dangerous Goods Act and Regulations* were enacted to promote public safety when dangerous goods are handled, offered for transport, or transported in Canada. The Regulations prescribe safety standards and requirements, and provide a mechanism for communicating the relative degree and nature of the hazard.

Legal Status of TDG

The transport of dangerous goods by road is regulated under provincial regulations, which parallel the *Federal Transportation of Dangerous Goods Act*. Compliance is ensured in Alberta by Alberta Transportation and Utilities. Inspectors may issue "tickets" on the road, for infractions. Typically, most infractions relate to deficiencies in training, shipping documentation or labelling.

Who Is Involved ?

All persons who handle, transport or offer for transport dangerous goods must meet the TDG Regulation requirements. The dangerous goods most likely to be transported by school system vehicles and personnel include chemical materials for instructional purposes, cleaners and other janitorial products, solvents and petroleum products, paints, and assorted chemical wastes. As a result, within a school, the following personnel should be knowledgeable regarding TDG Regulations:

- school administrators
- teachers responsible for technical areas
- lab technicians
- facility operators.

TDG Regulations are composed of three keys elements:

- training
- shipping documents
- labelling.

Training

No person can handle, offer for transport, or transport dangerous goods unless that person is properly trained or under the direct supervision of a properly trained person. A person cannot direct another person unless they also have received appropriate training. The school board must ensure that training has been received by all personnel that handle, offer for transport, or transport dangerous goods and must see that Certificates of Training (valid for three years) have been issued. This applies to the generators of dangerous goods (schools) and carriers of dangerous goods (school board shipping department).

Shipping Documents

All shipments of dangerous goods must be accompanied by a shipping document containing information identifying the goods, shipper, carrier and receiver as well as quantities, safe handling and emergency procedures. The shipper, carrier and receiver must retain a copy of the dangerous goods shipping document and any additionally pertinent documents, following delivery of the consignment. *(These documents must be made available to a government inspector within 15 days of a written request and must be retained for two years by all three parties.)*

Labels

Placards on transporting vehicles are not needed for most materials that will be carried in the school system because of the small quantities involved (there are, however, some exceptions). Boxes containing separate classes of dangerous goods must be labelled with the primary classification, orientation sticker (if liquid), and any other pertinent safe handling information. Individual containers of dangerous goods, if shipped separately, must have a TDG label attached indicating proper shipping name, PIN #, primary and secondary classifications, an orientation sticker (if liquid) and any other pertinent handling information.

2. Emergency Preparedness

The impact of an accident can be greatly reduced through effective planning. In addition, planning also ensures that the resources required to deal with an unexpected situation are available.

Emergency Response Plan

Students and teachers in CTS programs must be prepared to respond to an emergency. An effective emergency response plan should include the following:

- clearly defined and understood set of procedures
- prominently posted local emergency telephone numbers
- identification and location of external assistance procedures
- evacuation plan in the event of a fire, chemical spill or gas leak
- easily accessed first-aid supplies
- knowledge and practice in applying first-aid techniques.

First-Aid Response Plan

a. First Aid

In accordance with School Board Policy, each school must ensure the development of a First-Aid Response Plan that is appropriate to the acute illnesses or injuries that may occur on school property. Within this plan, CTS teachers must ensure that they have:

- identified those acute injuries or illnesses that they may reasonably expect to occur in their areas of responsibility.

  (The expectation is for the teacher to ensure that there is identification of the types of acute injuries or illnesses that they could reasonably expect to occur in their areas. This information will be based on the type of work being done in the area, and on types and frequencies of previous injuries or illnesses.)

- understand what their roles and responsibilities are under the school's First-Aid Response Plan.

  (Everyone in the school needs to know his or her role in putting the First-Aid Response Plan into practice.)

- received training appropriate to the acute injuries or illnesses that may occur in their areas, and the proximity to other emergency services. At minimum, this training shall result in the instructor having readily available access to competent first-aid help. All training must be approved by the First-Aid Training and Standards Agency.

  (The training needed will vary with the needs of the particular CTS area. Schools located far from other emergency services will need to have people with the extra skills necessary to stabilize an injured person for the longer travel to acute care hospital.)

- provided their areas with first-aid response equipment appropriate to both the acute injuries or illnesses that may occur, and the proximity to other emergency services. As a minimum, a basic first-aid kit, containing the equipment specified by the First-Aid Training and Standards Agency, would be required.

  (First-aid response equipment will vary considerably according to the needs of a particular CTS function. A minimum expectation would be that all work sites have some type of basic first-aid kit. In areas remote from services, the expectation would be on the school to provide the equipment needed to respond to first-aid emergencies.)

- became familiar with the location and content of the school's First-Aid Response Plan, especially with regard to the specific procedures on how to respond to those acute illnesses or injuries that may occur.

  (First-aid response procedures detail the action steps required to deal with the immediate emergency. Schools can contact their local Health Authority for assistance.)

- kept written records of acute injuries or illnesses that occur in their areas of responsibility. At minimum, the records should include name of person, name and qualifications of person giving first-aid, time of injury, description of injury, location and description of injury cause, and actions taken to prevent recurrence. Records should be kept for three years.

  (Records are necessary to provide data for program review.)

- reviewed their CTS first-aid response capabilities every three years, or whenever there are significant changes in the operating conditions in the CTS work area.

(First-aid response capabilities in CTS need to be reviewed to ensure their effectiveness and to identify opportunities for improvement. The intent here would be to allow some flexibility in how the CTS instructor accomplishes this task, but at the same time ensure that some type of review is carried out.)

b. Fire Prevention and Suppression

There is a higher risk of a fire starting in a CTS facility than in other program areas because of the nature of many CTS activities. Fuels such as paper, plastic, wood, paint, oily rags, cleaning solvents and oxidizing agents that support combustion are often found in CTS labs. Conditions that can cause ignition, including electrical equipment, heating devices, open flames and sparks are also present in many CTS programs.

Fires can be prevented by eliminating the fuel source and sources of ignition through good housekeeping, proper storage of materials and appropriate use of equipment.

Not all fires have the same characteristics, therefore it is important to know the class of fire and the recommended type of fire extinguisher.

Types of Fires and Extinguishers

Class A fires are associated with common materials such as wood, paper, rubber and most plastics. This class of fire can be extinguished by bringing the temperature of the burning materials below the ignition point using water or by the blanketing and smothering effects of a dry chemical or carbon dioxide extinguisher.

Class B fires are associated with a flammable liquid, gas and grease. This class of fire is best extinguished by limiting the air that supports the fire. Dry chemicals, carbon dioxide and foam agents are recommended for this class of fire. Water, unless it is a form of mist, is not recommended because it tends to spread the fire.

Careless smoking and electrical failure are the most common cause of industrial fires.

Class C fires are mainly caused by the misuse of electrical equipment and/or electrical failures. The first step in extinguishing this type of fire is to shut off the electrical supply. Only extinguishers with a class C rating are recommended to be used with this type of fire.

Class D fires occur when combustible metals such as magnesium, powdered aluminum and zinc are ignited. Dry sand or a class D extinguisher can be used to exclude air.

c. Release of Hazardous Materials

Owing to possible damage to the environment and risk of danger to the health and safety of others, a plan should be in place to deal with the release of hazardous materials.

If a large spill were to occur off-campus, those involved are required to immediately report the accident to proper authority, generally by contacting the Pollution Emergency Response Team at 1-800-222-6514 or by calling 911.

Smaller spills that may occur in a lab or shop should be confined and cleaned up as soon as possible. To do this, a conveniently located clean-up kit is recommended. A kit of this nature should include the following material and equipment:

Clean-up Kit

- bag of granular absorbent
- damming materials
- neutralizing agents
- garbage bags
- plastic garbage cans
- goggles and respirator
- latex gloves, coveralls and rubber boots
- broom and dustpan.

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B. Contact: Emergency Response When an Accident Occurs

1. Response to Injury

In the event of an accident, it is important to act quickly yet take time to evaluate the extent of the injury/accident and the potential for further damage to personnel or property. When an accident occurs:

- take control of the situation through effective management techniques
- ensure that any injured person(s) is cared for
- ensure that no further injury and/or damage occurs
- proceed to get help.

2. Response to Hazardous Materials Spills

In the event of a serious spill, alert others, get away from the area and report the accident to the proper authorities by calling 911 or the fire department.

For smaller spills:

- secure the area
- keep others away from the spill
- get assistance
- contain the spill
- clean up the spill.

Before attempting a clean up, check the Material Safety Data Sheet for recommended procedures. It should be noted that all cleaned up materials, contaminated absorbent and clothing should be treated the same way as the spilt material and disposed of in a similar fashion in clearly marked container.

3. Response to Fire

A typical response to a fire would include:

- if visible fire or smoke is detected, evacuate the area and isolate the fire by closing the doors
- have someone notify the teacher or administration
- pull the nearest fire alarm
- if the fire is small and contained attempt to extinguish it using the appropriate fire extinguisher.

4. Response to Natural Gas or Propane Leak

Because propane is heavier than air a leak may spread into a ventilation or sewer system. If the gas should ignite the fire could spread rapidly and cause an explosion in a confined space. When a leak is detected:

- evacuate the area
- locate and stop the leak if possible
- do not operate any electrical equipment
- notify the appropriate staff person
- remove any victims to fresh air and apply CPR if necessary.

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C. Post Contact: Accident Investigation and Reporting

By definition, an incident is any unplanned event that may or may not result in damage or injury. The major purpose of an investigation is not to attach blame but to identify the causes of the incident/accident so that corrective measures can be taken to prevent a similar incident in the future. Refer to Attachment 4: Accident Cause and Correction Model.

When investigating an accident the investigator needs to:

- get an overall view of what happened
- identify the circumstances that contributed to the accident
- examine physical evidence such as equipment and material
- take photographs and/or collect and safeguard any physical evidence if warranted
- talk to people directly involved and/or witnesses. Obtain written statements if necessary
- identify causes and determine corrective action
- maintain records of incidents and corrective measures in keeping with board/school policy.

III SOURCES OF SUPPORT: REGULATORY, MONITORING, CONSULTING

A. Legislation and Regulations

The health and safety of individuals and the environment is protected by law. Every worker has the right to know about the hazardous materials they may come in contact with, be protected from injury and receive the proper care and attention if they do become involved in an accident. For an overview of the legislation that affects both the employer and the employee and in turn the student, refer to Attachment 5.

B. Key Players: Roles And Responsibilities

To ensure that there is an effective health and safety program in place requires the cooperation and support of all those responsible for the learning environment, development of curriculum and the delivery of instruction. This involves the education community as well as various government department and agencies who have responsibility for various aspects of health and safety.

Education Community

1. Alberta Education (draft)

- works cooperatively with school boards in the development of school safety policy(s) and guidelines
- creates legislation as required and provides information explaining relevancy of legislation to the school
- identifies activities within the curriculum that may be hazardous.

2. School Board (draft)

- formulates safety policy(s) in conjunction with the appropriate education professionals
- adopts safety policy statements consistent with regulations and codes
- facilitates the implementation of safety policy(s)
- requests and/or directs safety and health investigations
- provides for, and administers, adequate funding for the provision of a healthy and safe environment
- ensures that the requirements of various agencies such as Occupational Health and Safety Division, Fire Commissioner and Building Standards, are carried out in their schools and other work sites under their jurisdiction

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- provides appropriate materials and equipment to maintain adequate standards of health and safety
- establishes procedures to monitor safety policies and direct investigations as required.

3. **Superintendent (draft)**
   - formulates and implements school board policy(ies)
   - communicates School Board policy(ies), especially the minimum standards, to staff, students, parents and the public
   - establishes a system to monitor the effectiveness of safety policies and practices in the schools.
   - initiates corrective action as required
   - implements an appeal system that extends beyond the local environment to governmental agencies that may result in local or government intervention
   - ensures that in each school there is one certified teacher and one support staff trained in first aid and emergency care.

4. **School Administration (draft)**
   - provides for educational programs and resources that assist in the development of good safety practices and attitudes
   - appoints one person to be responsible for the coordination of health and safety programs and resources in the school
   - maintains accurate records of accidents at school and the treatment provided
   - provides direction and support to teachers regarding student safety supervision and/or violations
   - identifies potentially hazardous conditions and ensures that safe practices and procedures are in place to correct them
   - ensures school representation on safety committees, who would be involved in safety inspections
   - conducts and/or facilitate regular safety inspections
   - ensures that teachers provide safety instruction as required in the courses they teach
   - reports accidents to the school board and the Workers' Compensation Board, as required.

5. Teaching Staff (draft)

- assumes the responsibility of protecting his or her health and safety and that of the students under his or her charge
- models safe behaviour in teaching practices and procedures
- accepts as a professional obligation the responsibility of providing and emphasizing safety education in the classroom
- implements document safety education programs in accordance with school board policy(ies) and the regulations and standards of other regulating bodies
- evaluates safety education efforts, monitors student behaviour, and initiates corrective action as required
- identifies unsafe environment conditions and correct or reports these in writing.

6. Students (draft)

- must be knowledgeable in both environment safety factors and safe behavioural practices
- should conduct themselves in accordance with established safety practices and rules such as appropriate dress and protective clothing
- should identify unsafe practices or environmental conditions and report these to the school staff
- should inform school staff of the possible health concerns relevant to their personal safety and protection.

7. Parents (draft)

- should inform the school about relevant student medical problems
- should inform the school if they wish their child to be excluded from particular course activities that may be potentially hazardous.

C. Due Diligence

Due diligence suggests that everything reasonably possible is being done to ensure the health and safety of students, teachers and the environment. Essentially, due diligence is achieved through constant monitoring and compliance with local policies and government regulations.

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Elements of a safety program include:

- establishing clearly defined policies, practices and procedures
- monitoring procedures to ensure that safe policies, practices and procedures are being followed
- communicating information on issues related to health and safety
- auditing/inspecting the learning environment
- training in issues related to health and safety
- accident investigation and reporting.

A list of actions that CTS teachers should follow is provided in Attachment 6: Due Diligence in the CTS Classroom.

ATTACHMENTS

Components of a Health and Safety Program ....Attachment 1

Health and Safety Hazard Risk in CTS Strands ....Attachment 2

CTS Health and Safety Sample Checklist ....Attachment 3

Accident Cause and Correction Model ....Attachment 4

Overview of Legislation and Key Players Related to Health and Safety in CTS Programs ....Attachment 5

Due Diligence in the CTS Classroom ....Attachment 6

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COMPONENTS OF A HEALTH AND SAFETY PROGRAM

ATTACHMENT 1

PRE-CONTACT
(Proactive Component)

What is done to prevent or reduce accidents:

- ensuring a safe environment
- ensuring safe practices and procedures
- providing training

CONTACT
(Reactive Component)

What is done when an accident or incident occurs:

- emergency response to:
  - injury
  - chemical spill
  - fire
  - gas leaks

POST-CONTACT
(Evaluative Component)

What is done to investigate an accident/incident and determine corrective action:

- investigation
- observation
- documentation
- reporting
- identification of corrective action

HEALTH AND SAFETY HAZARD RISK IN CTS STRANDS

ATTACHMENT 2

	PHYSICAL										CHEMICAL												BIOLOGICAL				ERGONOMIC			
STRANDS:	Noise	Temperature Extremes	Radiation	Lifting	Heights/Falls	Caught Between/Under	Electric Shock	Caught in Equipment	Struck by Moving Object	Fire & Explosion	Welding/Solder Fumes	Paints	Wood Dusts	Silica and Abrasive Dust	Asbestos	Solvents and Cleaners	Lab Chemicals	Liquid Fuels and Adhesives	Coolants	Pesticides/Herbicides	Fiberglass/Resins	Gases	Bacteria/Viruses	Parasites	Mould/Fungi	Plants/Pollen	Excessive Force	Excessive Repetition	Improper Posture	Incorrect Lighting
Agriculture	■	▦	■	▦		▦	▤	■	■	▤	▤			▤		▤	▦		▦	■		▦	▦	▦	▦	■	▦	■	▦	
Career Transitions																														
Communication Technology	▤					▤											▦	▤										▦	▦	▤
Community Health					▦			▦										▤					▦	▦	▦				▦	
Construction Technologies	■			▦	▦	▦	▤	▦		▤			■	▦		▤		■			▤						■	▦	▤	
Cosmetology Studies				▤												▤													▤	▤
Design Studies	▤							▤										▤										▤	▤	▤
Electro-Technologies	▤	▦	▤	▤		▤	■		▤	▤	■					▦	▤	▤										▤	▤	▤
Energy and Mines	■	▦	▦	▦	▦	▦	▤	■	■	■	▤			▦		▤	▦		▦			▦	▤	▤	▤	▤	■	▦	▦	
Enterprise and Innovation																														
Fabrication Studies	■	▦	▦	▤	▤	■	▤	■	▦	▦	■	▤		▦								▦					■	■	▦	▤
Fashion Studies		▦				■	▤	■																					▤	▤
Financial Management																														
Foods		■	▤			▦	▦	▦		■						▤			▤			▤	■							
Forestry		▦	■	▤	▤	▤		▦	▦	▤			▤			▤	▦		▦	■		▤	▤	▤	▦	■	▦	■	▦	
Information Processing																														
Legal Studies																														
Logistics		▤		▦			▦	■	▦	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤	▤
Management and Marketing								▤																						
Mechanics	▤	▦		■	▦	▦	▤	▦	▤	■	▤	▤		▦	■	■		▦	■	■	■	■					■	▤	▤	▤
Tourism Studies																													▤	▤
Wildlife		▦	▦	▤	▤	▤		▤	▤	▤							▦		▦			▤	▤	▤	▦	■	▤	▤	▦	

Level of Risk: ▤ Low Risk ▦ Medium Risk ■ High Risk

CTS HEALTH AND SAFETY SAMPLE CHECKLIST ATTACHMENT 3

School: ____________________

Program: ____________________ Facility: ____________________

Inspection made by: ____________________ ____________________
Please Print Name Position

Signature: ____________________ Date: ____________________

General Questions:

1. Who is responsible for the health and safety program in this facility? ____________________ Administrator ____________________ Teacher(s)
2. Has a previous written safety inspection been made of this facility: Yes ☐ No ☐ (If No, move to page 42)
3. If Yes, by whom? ____________________
4. Date of that inspection. ____________________
5. Have the recommendations of that inspection been carried out? If not, indicate the status of those exceptions below: All ☐ Some ☐ None ☐

Date Identified	Concern(s)	Corrective Action(s) and Anticipated Completion Date

Source: Adapted from materials supplied by the Calgary Roman Catholic Separate School District No. 1

Hazard Identification and Control

To identify the health and safety hazards in the learning environment is one of the most important components of a health and safety program. The individual or team that carries out this inspection should carefully evaluate the condition and appropriateness of all facilities, work areas, equipment and instructional procedures. Each unsafe act or condition should be noted and a recommendation to correct or remove the hazard be provided. Since the learning environment is not static, it is essential that ongoing vigilance and control of health and safety hazards continue.

Checking Procedure:

Draw a ○ around the appropriate number using the following rating scale:

Satisfactory		Unsatisfactory			
4	3	2	1	0	N/A

Action required should be identified in all instances where a number of 2 or less is circled. Space is provided at the end of each topic for such comments.

Section I: Facilities

A. Housekeeping

Evaluate the condition of:

	Satisfactory			Unsatisfactory		
1. walls, windows and ceiling (e.g., clean, free of chips and cracks)	4	3	2	1	0	N/A
2. floors, aisles and stairs (e.g., clean and free of obstructions)	4	3	2	1	0	N/A
3. student workstations (e.g., benches, tables and desks)	4	3	2	1	0	N/A
4. shelves, tool and material storage areas	4	3	2	1	0	N/A
5. bulletin boards and display cases	4	3	2	1	0	N/A
6. washing and changing facilities	4	3	2	1	0	N/A
7. waste disposal areas and containers (incompatible materials should not be allowed to come in contact with each other)	4	3	2	1	0	N/A
8. power panel and gas meter areas (e.g., free of obstructions and combustible materials)	4	3	2	1	0	N/A
9. Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

B. General Conditions

Evaluate the provision for / condition of:	Satisfactory			Unsatisfactory		
1. clearly marked and accessible exits	4	3	2	1	0	N/A
2. emergency lighting	4	3	2	1	0	N/A
3. safety treads and railings on stairs	4	3	2	1	0	N/A
4. safety zone markers around hazardous equipment	4	3	2	1	0	N/A
5. non-skid floor surfaces in front of machines	4	3	2	1	0	N/A
6. air quality (general ventilation, fume extraction and dust control systems)	4	3	2	1	0	N/A
7. lighting direction and levels	4	3	2	1	0	N/A
8. noise levels (see page 13)	4	3	2	1	0	N/A
9. Other: ______________________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

C. Electrical Supply

Evaluate provision for / condition of:	Satisfactory			Unsatisfactory		
1. electrical outlets (outlets should not be overloaded)	4	3	2	1	0	N/A
2. power panel breakers and circuit identification	4	3	2	1	0	N/A
3. master control and emergency shut-off switches	4	3	2	1	0	N/A
4. electrical conduit, cables, connections and extension cords	4	3	2	1	0	N/A
5. high voltage signage	4	3	2	1	0	N/A
6. explosion proof switches and fixtures (e.g., paint room)	4	3	2	1	0	N/A
7. Other: ______________________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

D. Gas Supply

Evaluate the provisions for / condition of:

		Satisfactory			Unsatisfactory		
1.	gas lines, valves, regulators and colour coding	4	3	2	1	0	N/A
2.	lighting instructions for gas-fired equipment and appliances	4	3	2	1	0	N/A
3.	pilot lights and/or electronic ignition systems	4	3	2	1	0	N/A
4.	fire guards between gas appliance and equipment and adjacent walls, benches and other combustible materials.	4	3	2	1	0	N/A
5.	combustion air supply	4	3	2	1	0	N/A
6.	Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

Section II: Furniture and Equipment

A. Lab Furniture and Equipment

The furniture / equipment is:

		Satisfactory			Unsatisfactory		
1.	arranged to provide maximum safety to the operator and other students	4	3	2	1	0	N/A
2.	properly adjusted and secured to floor, bench or cart	4	3	2	1	0	N/A
3.	guarded at all exposed points of operation	4	3	2	1	0	N/A
4.	controlled easily (switches and levers accessible)	4	3	2	1	0	N/A
5.	provided with dust extraction or ventilation where required	4	3	2	1	0	N/A
6.	provided with working surfaces appropriate to the tasks performed (e.g., electrical work should not take place on a metal surface)	4	3	2	1	0	N/A
7.	serviced and maintained on a regular basis	4	3	2	1	0	N/A
8.	provided with electromagnetic switches where required (e.g., drill press, table saw, wood and metal lathes)	4	3	2	1	0	N/A
9.	CSA approved (applies to all electrical equipment)	4	3	2	1	0	N/A
10.	properly grounded or double insulated.	4	3	2	1	0	N/A
11.	Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

B. Fire Protection

Evaluate:

		Satisfactory			Unsatisfactory		
1.	emergency exit routes and signage	4	3	2	1	0	N/A
2.	proper type, location and service records of fire extinguishers	4	3	2	1	0	N/A
3.	provision and use of fire-proof pads under electric irons, hot plates and other portable heating devices	4	3	2	1	0	N/A
4.	type of storage of chemicals and flammable materials	4	3	2	1	0	N/A
5.	storage of oily rags and other combustible materials	4	3	2	1	0	N/A
6.	placement and condition of smoke detectors and/or heat sensors	4	3	2	1	0	N/A
7.	condition and use of heat fuses (used in conjunction with extinguishing system and parts washer lids)	4	3	2	1	0	N/A
8.	Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

C: Personal Protective Equipment

Evaluate provision for / condition of:

		Satisfactory			Unsatisfactory		
1.	appropriate eye protection (e.g., face shields, goggles and safety glasses)	4	3	2	1	0	N/A
2.	hand protection (e.g., rubber gloves, leather gauntlets and heat-resistant gloves)	4	3	2	1	0	N/A
3.	foot protection (e.g., safety shoes and toe caps)	4	3	2	1	0	N/A
4.	head covering / protection (e.g., hats, hair nets, hard hats and bump caps)	4	3	2	1	0	N/A
5.	respiratory protection (e.g., dust, paint and spray masks)	4	3	2	1	0	N/A
6.	protective clothing (e.g., aprons, gowns, smocks and leggings)	4	3	2	1	0	N/A
7.	hearing protection (e.g., ear plugs and muffs)	4	3	2	1	0	N/A
8.	Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

D. First-Aid Equipment

Evaluate availability / condition of:

		Satisfactory			Unsatisfactory	
1. first-aid kit	4	3	2	1	0	N/A
2. eye wash station	4	3	2	1	0	N/A
3. emergency shower	4	3	2	1	0	N/A
4. first-aid information	4	3	2	1	0	N/A
5. fire blanket	4	3	2	1	0	N/A
6. Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

Section III: Instructional Program

A. Posted Information

Evaluate:

		Satisfactory			Unsatisfactory	
1. use of bulletin boards, health and safety posters and student reports	4	3	2	1	0	N/A
2. suitability and type of safety instruction posted at each machine	4	3	2	1	0	N/A
3. emergency response procedures and postings	4	3	2	1	0	N/A
4. availability of important phone numbers and contact people to be used in the event of an accident or injury	4	3	2	1	0	N/A
5. Other: ______________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

B. Handling Materials / Goods

Evaluate:

	Satisfactory			Unsatisfactory		
1. instruction on the use of hazardous materials (WHMIS)	4	3	2	1	0	N/A
2. availability and maintenance of Material Safety Data Sheets	4	3	2	1	0	N/A
3. labels on controlled product containers	4	3	2	1	0	N/A
4. methods used to dispose of hazardous materials	4	3	2	1	0	N/A
5. material lifting and handling instructions and procedures	4	3	2	1	0	N/A
6. procedures used to transport dangerous goods	4	3	2	1	0	N/A
7. personal hygiene related to customer service (e.g., hair nets, plastic gloves and hand washing)	4	3	2	1	0	N/A
8. Other: ____________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

C. Record Keeping

Evaluate:

	Satisfactory			Unsatisfactory		
1. documentation of safety lesson plans and presentations	4	3	2	1	0	N/A
2. records of student attendance	4	3	2	1	0	N/A
3. records of student safety tests and results	4	3	2	1	0	N/A
4. reporting mechanisms for accidents and injuries	4	3	2	1	0	N/A
5. records of follow-ups measures	4	3	2	1	0	N/A
6. records of facility and program inspection	4	3	2	1	0	N/A
7. records of requests for facility / equipment improvements	4	3	2	1	0	N/A
8. Other: ____________________	4	3	2	1	0	N/A

Comments: (concerns, required actions, recommendations)

Summary of Recommendations

Rank the identified concerns according to those that have the highest probability of placing the students and teachers in immediate danger.

Efforts should first be directed towards correcting those problems that have the most serious consequence and highest probability of occurrence, followed by those that are less hazardous.

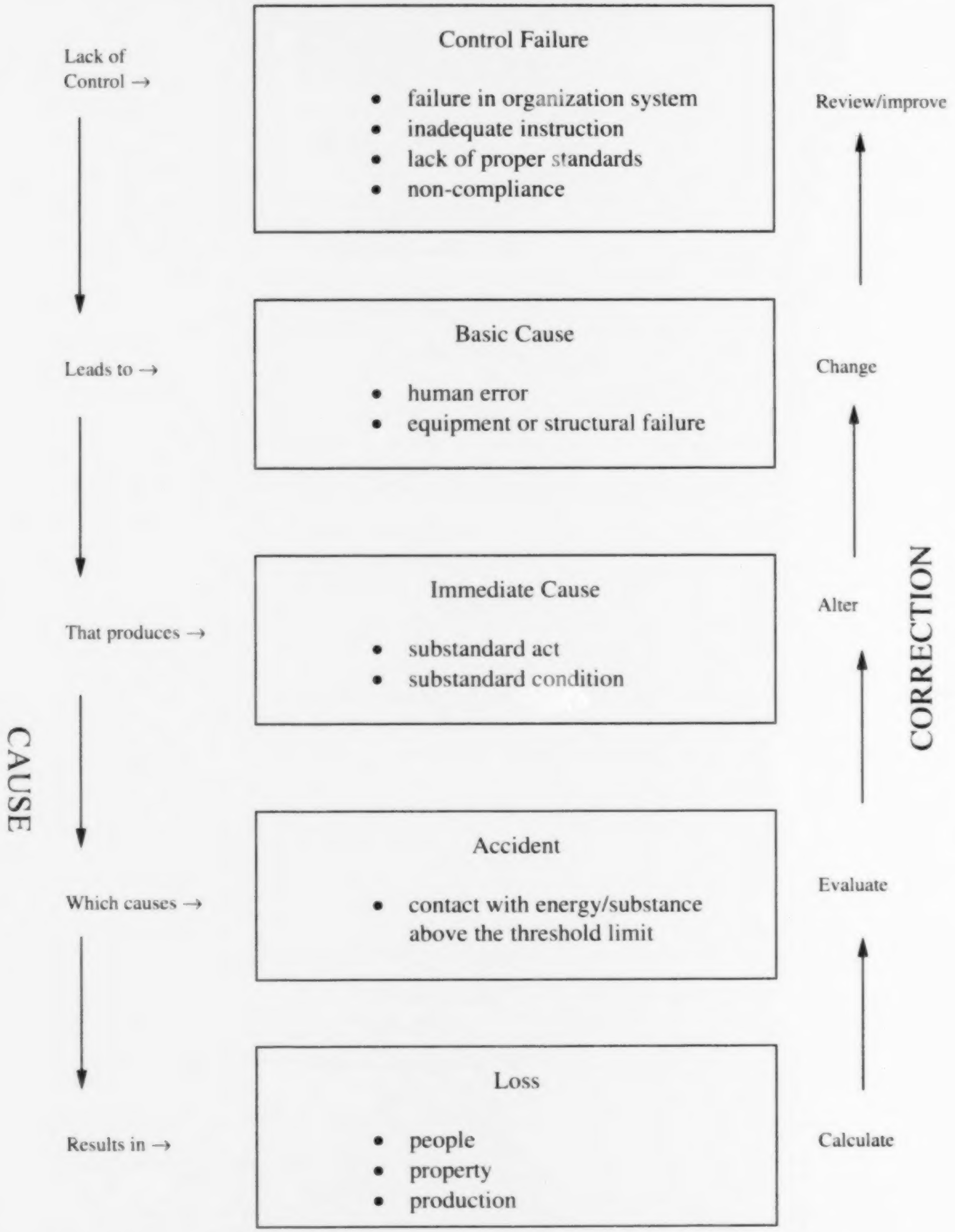
Item No.	Concern(s)	Required Action(s)

Signature ______________________

Date: ______________________

ACCIDENT CAUSE AND CORRECTION MODEL

ATTACHMENT 4



Lack of Control →
Leads to →
That produces →
Which causes →
Results in →
CAUSE
Review/improve
Change
Alter
Evaluate
Calculate
CORRECTION

Control Failure

- failure in organization system
- inadequate instruction
- lack of proper standards
- non-compliance

Basic Cause

- human error
- equipment or structural failure

Immediate Cause

- substandard act
- substandard condition

Accident

- contact with energy/substance above the threshold limit

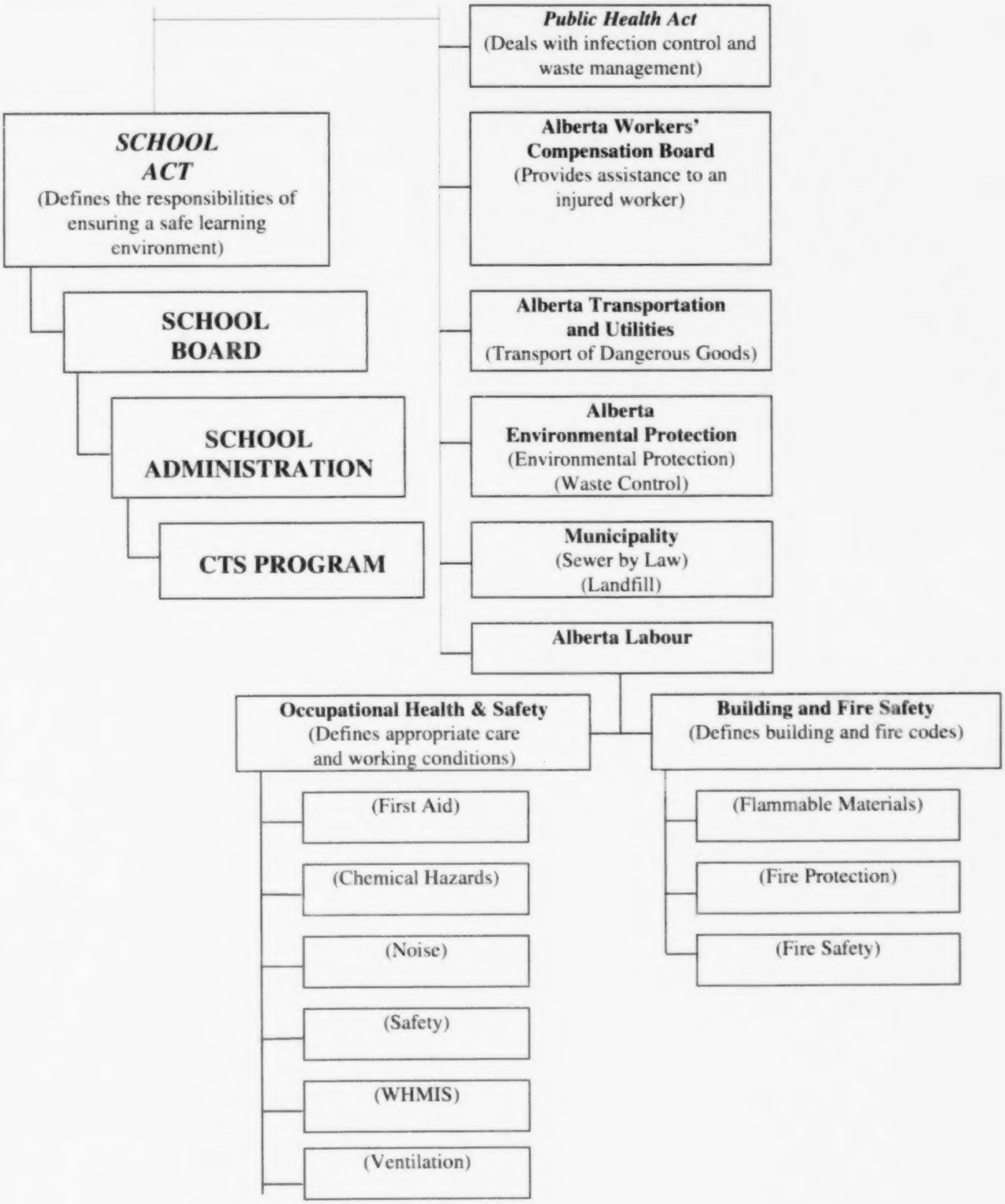
Loss

- people
- property
- production

Source: Adapted from materials supplied by the Calgary Board of Education

OVERVIEW OF LEGISLATION AND KEY PLAYERS RELATED TO HEALTH AND SAFETY IN CTS PROGRAMS

ATTACHMENT 5


Public Health Act
(Deals with infection control and waste management)
SCHOOL ACT
(Defines the responsibilities of ensuring a safe learning environment)
Alberta Workers' Compensation Board
(Provides assistance to an injured worker)
SCHOOL BOARD
Alberta Transportation and Utilities
(Transport of Dangerous Goods)
SCHOOL ADMINISTRATION
Alberta Environmental Protection
(Environmental Protection)
(Waste Control)
CTS PROGRAM
Municipality
(Sewer by Law)
(Landfill)
Alberta Labour
Occupational Health & Safety
(Defines appropriate care and working conditions)
Building and Fire Safety
(Defines building and fire codes)
(First Aid)
(Chemical Hazards)
(Noise)
(Safety)
(WHMIS)
(Ventilation)
(Flammable Materials)
(Fire Protection)
(Fire Safety)

DUE DILIGENCE IN THE CTS CLASSROOM ATTACHMENT 6

1. Provision of a Safe Work Environment

A. Physical Environment

- Maintain a clean and orderly work environment.
- Ensure that all tools, machines, safety equipment, and other equipment, are maintained, safe and in good working condition.
- Be able to use competently and safely, all tools, machines, safety equipment and other equipment.
- Know what safety devices are necessarv, and be familiar with, and be able to use, all safety devices for your tools, machines and equipment.
- Know the locations of and be able to use fire extinguishers.
- Be sure that fire extinguishers are maintained.
- Ensure proper storage of all materials and supplies.
- Be able to operate the electrical safety control system in the teaching environment.
- Check that lighting, heating/cooling, plumbing, and ventilation are functioning and adequate. Report inadequacies to your administrator.

B. Program

- Provide an exemplary model of how to operate safely in the work environment.
- Provide a safety training program for your students with respect to all tools, machines, safety equipment, and other equipment, that contains the following elements:
  - demonstration and explanation
  - guided and observed use until competence is achieved
  - inform the student when competence is achieved
  - formal recognition of competence
  - ongoing monitoring of performance
- Ensure that all students know and can perform the emergency procedures you have established as part of the safety program.
- Ensure that students report all accidents/incidents/near-misses.
- Ensure that all students use appropriate safety gear when necessary.
- Maintain a high level of order and discipline.
- Do not accept any unsafe behaviour. Remove any student who is acting in an unsafe manner, and ensure that he or she can operate safely before re-admittance.

- Ensure that all students handle all materials and supplies in a safe manner.
- Ensure that students are dressed safely.
- Continually monitor the student's learning environment.

C. Emergency Response Skills

- Know the school's emergency response plan.
- Know your role in the school emergency response plan.
- Become an emergency response team member.
- Respond appropriately to emergencies.
- Be able to use first-aid kit equipment.
- Become first-aid certified - *Emergency Level/CPR*

D. Accident/Incident Investigation Skills

- Know the accident/incident reporting procedure.
- Know what accidents/incidents are to be reported.
- Be able to prepare a full and accurate report(s).
- Know to whom the report(s) must be given.
- Treat near-miss information appropriately.
- Use accident/incident/near-miss information in the continual upgrading and provision of a safer work environment.

Source: Adapted from materials provided by Edmonton Public Schools.

REFERENCES

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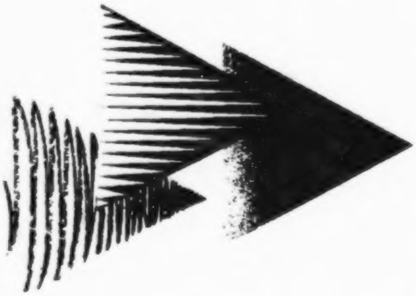

CAREER AND TECHNOLOGY STUDIES

Manual For Administrators, Counsellors and Teachers

Appendix 14:

CREDENTIALLING OPPORTUNITIES FOR CTS STUDENTS

August 1997 (Interim)

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PURPOSE

The purpose of this document is to encourage the cooperative, efficient planning and development of potential credentialling opportunities for students. There is no guarantee that these credentialling opportunities will be in place in all communities on an ongoing basis. The most current information on credentialling opportunities will be posted on the CTS Website: http://ednet.edc.gov.ab.ca.

CTS Team
August 1997

Questions or comments about this Manual for Administrators, Counsellors and Teachers are welcomed and should be directed to:

Career and Technology Studies Unit, Curriculum Standards Branch, Alberta Education,
Devonian Building West, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2.
Telephone: (403) 422–4872*, Fax: (403) 422–0576

*Alberta Government offices can be reached toll free by dialing 310–0000.

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CREDENTIALLING AND APPRENTICESHIP OPPORTUNITIES FOR CTS STUDENTS

CTS offers several credentialling opportunities for students if they are able to meet the competency requirements of external credentialling agencies and/or successfully demonstrate specified competencies within selected strands. The chart below summarizes the potential credentialling opportunities at the different levels within a particular strand.

Credential Linking to CTS Strands
Credentials provide written evidence of one's qualifications. The credentials that link with CTS starnds and modules are offered by outside agencies and require students to meet specific standards that are recognized in the workplace, in the community and/or by post-secondary institutions. A certificate is normally issued to persons completing a specific area of study.

The following chart summarizes the credentialling opportunities available at each of the three levels for selected strands. A detailed listing of currently linked credentials is shown on the Credentialling Opportunities in CTS (pages 3 – 11) and the contacts are provided in the Credentialling Contacts (page 20).

Credentialling Opportunities for Selected CTS Strands by Strand Level

CTS Strand	Levels		
	Introductory	Intermediate	Advanced
Career Transitions	x	x	x
Community Health	x	x	x
Construction Technologies			x
Energy & Mines		x	x
Foods	x	x	
Forestry	x	x	x
Tourism	x		
Wildlife	x	x	x

Apprenticeship Trades Accredited to CTS Strands:
Alberta Education has negotiated with Alberta Apprenticeship: Industrial Training Division, Alberta Advanced Education and Career Development to accredit selected CTS strands and specified modules to related trades. The following chart summarizes the CTS strands for which accreditation has been negotiated. The module requirements for each strand are included in the Apprenticeship Accreditation Opportunities in CTS (pages 12 – 19). For more information on Apprenticeship Opportunities, contact an Alberta Career Development Centre (page 21).

Trades Accredited to CTS Strands

Accredited Trade	Accredited CTS Strands (See GSI for each strand for details of specific modules to be successfully completed for accreditation)			
	Cosmetology	Fabrication Studies	Foods	Mechanics
Automotive Service Technician				X
Cook			X	
Hairstylist	X			
Welder		X		

Benefits of offering credentialling opportunities:

For students:

- increases employment opportunities
- creates opportunities for post-secondary transitions (advanced standing, admission priority)
- enhances credible and relevant learning
- motivates students to succeed
- provides a vehicle for learning employability skills in a relevant context
- provides accessibility for all secondary school students
- provides an opportunity to develop skills students can apply in their daily lives and in the future
- provides the advantage for students to acquire an external certificate as well as CTS credit towards a high school diploma
- enhances the student's resume

For the school and teacher:

- facilitates business and community involvement
- attracts students
- provides external standards set definite criteria that must be met
- provides a vehicle for teaching employability skills
- enhances credibility of school programs

For the workplace and/or post-secondary institutions:

- assures that the student has the competencies required to enter a workplace/program
- provides an indication that students are committed to this area and therefore should be more successful.

Potential challenges to offering credentialling opportunities in the community:

- changing institutional paradigms (e.g., alternative forms of delivery)
- preparing for instruction (qualifications of instructors that are in addition to Professional Teaching Certificate, source of materials, equipment and/or supplies)
- dealing with participant costs
- researching potential credentialling agencies to determine the most cost-effective program for students
- requiring schools to work cooperatively with community agencies offering similar programs
- requiring schools to be aware of potential certification programs available
- a timetable structure that will accommodate student and agencies needs
- establishing acceptance by the workplace and post-secondary institutions to recognize that adolescents will demonstrate the responsibilities attached to the certificate
- assisting students in identifying employers willing to provide apprenticeship opportunities.

Summary of Credentialling Opportunities in CTS

Credential	Agriculture	Career Transitions	Community Health	Construction Technologies	Energy and Mines	Foods	Forestry	Tourism	Wildlife
Alberta Conservation and Hunter Education Program									x
Alberta Fishing Education Program									x
Alberta Tourism Industry Standards: Freshwater Angling Guide							x		x
Alberta Tourism Industry Standards: Hunting Guide							x		x
Alberta Tourism Industry Standards: Outdoor Guide							x		x
Athletic First Aid			x						
Babysitting			x						
Canadian Firearms Safety Course		x							
CPR Level C		x	x						
Child Care First Aid			x						
Day Care Level 1			x						
Emergency Child Care			x						
Explosive Actuated Tools				x					
Family Health Care			x						
Farm Pesticide Certificate Program		x							
First-Aid Certification: Advanced First Aid Level II		x			x				
First-Aid Certification: Child Care			x						
First-Aid Certification: Emergency First Aid		x							
First-Aid Certification: Standard First Aid			x						
First-Aid: Basic Wilderness		x							
Flowers Canada Accreditation Program: Design Skills	x								
Flowers Canada Accreditation Program: Retail Skills	x								
Green Certificate Farm Training Program: Beef Production	x								
Green Certificate Farm Training Program: Crop Production	x								
Green Certificate Farm Training Program: Dairy Production	x								
Green Certificate Farm Training Program: Irrigated Crop Production	x								
Green Certificate Farm Training Program: Sheep Production	x								
Green Certificate Farm Training Program: Swine Production	x								
Job Safety Skills		x							
Lawn and Garden Domestic Pesticide Dispenser Course		x							
Oxygen Administration		x	x						
Pesticide Applicator Certificate, Agriculture		x							
Pesticide Applicator Certificate, Industrial		x							
Pesticide Applicator Certificate, Landscape		x							
Petroleum Industry Training Program: Blowout Prevention					x				
Petroleum Industry Training Program: Floorman Training					x				
Petroleum Industry Training Program: Hydrogen Sulphide Alive					x				
Petroleum Industry Training Program: Oilfield Maintenance					x				
Petroleum Industry Training Program: Petroleum Fundamentals					x				
Power Engineering Technology		x							
Retail Pesticide Dispenser Certificate (Class I)		x							
Safe Food Handler						x			
Tourism: Alberta Best								x	
Transportation of Dangerous Goods (TDG)		x							
Workplace Hazardous Materials Information System (WHMIS)		x							

CREDENTIALLING OPPORTUNITIES IN CTS

1. AGRICULTURE RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Farmer Pesticide Certificate Program	Extension Services, Olds College	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes, with Olds College	
Flowers Canada Accreditation Program • Design Skills • Retail Skills	Flowers Canada, The Association of the Canadian Floral Industry		Floral Design 1 (AGR2080) Floral Design 2 (AGR3080)	Not finalized at this time Evaluation done by Flowers Canada member	Contact: Flowers Canada, Association of the Canadian Floral Industry or, Flowers Canada, Alberta Region
Green Certificate Farm Training Program • Beef Production • Dairy Production • Crop Production • Irrigated Crop Production • Sheep Production • Swine Production	Alberta Agriculture, Food & Rural Development		Field, Nursery and Greenhouse Crops 1 (AGR2030) Field, Nursery and Greenhouse Crops 2 (AGR3030) Livestock, Poultry and Animal Specialties 1 (AGR2040) Livestock, Poultry and Animal Specialties 2 (AGR3040)	None Final evaluation done by Green Certificate personnel, Alberta Agriculture, Food and Rural Development	
Lawn and Garden Domestic Pesticide Dispenser Course	Extension Services, Olds College	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes, with Olds College	
Pesticide Applicator Certificate • Agriculture • Landscape • Industrial	Continuing Education, Lakeland College	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	None Certification available upon successful completion of extension course and final examination	
Retail Pesticide Dispenser Certificate (Class I)	Continuing Education, Lakeland College	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)		

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

2. CAREER TRANSITIONS RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Job Safety Skills	Job Safety Skills Society		Personal Safety (Management) (CTR1210) Workplace Safety (Practices) (CTR2210) Safety Management Systems (CTR3210)	Variable (e.g., First-Aid, WHMIS)	
Emergency First-Aid	St. John Ambulance The Canadian Red Cross Society		Personal Safety (Management) (CTR1210)	Certified First-Aid/CPR Instructor	See *Community Health*

3. COMMUNITY HEALTH RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Babysitting	St. John Ambulance The Canadian Red Cross Society		Caring for Children (CMH1040)	none (Preferably Standard First-Aid Certificate)	Includes AR, treatment for burns, poisoning, wounds, bleeding and baby care techniques
Emergency Child Care First-Aid in Child Care Child Care First Aid	St. John Ambulance The Canadian Red Cross Society		First-Aid/CPR for Infants and Children (CMH3120)	Certified First-Aid/CPR Instructor with a Child Care Instructor designation	3 year nationally recognized certificate designed for child care workers (day care, police, fire, playground supervisors) • includes adult, infant and child CPR • recognized by Alberta Family & Social Services
Emergency First-Aid	St. John Ambulance The Canadian Red Cross Society	CTR	Personal Safety (Management) (CTR1210)	Certified First-Aid/CPR Instructor	3 year nationally recognized certificate includes AR, treatment for choking, bleeding, shock and one rescuer CPR. • currently recognized by OH&S as First-Aider II (under revision) • St. John Ambulance: minimum 11 years of age

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

3. COMMUNITY HEALTH RELATED AREAS (continued)

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Standard First-Aid	St. John Ambulance The Canadian Red Cross Society		First-Aid/CPR (CMH2120)	Certified First-Aid/CPR Instructor	3 year nationally recognized certificate includes Emergency First-Aid, plus treatment of bone and joint injuries, heat, cold emergencies, medical conditions. • currently recognized by OH&S as First-Aider I (under revision) • St. John Ambulance: minimum 14 years of age • Red Cross recommends retraining every two years
Family Health Care	St. John Ambulance The Canadian Red Cross Society (potential)		Home Care 1, 2 and 3 (CMH1060, 2060, 3060)	none	Under revisions
Day Care Level I	Alberta Family and Social Services		Day 1 and 2 (CMH2050, 3050) plus 2 practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	none	The minimum qualification required by Day Care Workers in Alberta. • recognized by Alberta Family and Social Services • must be 16 years of age
Athletic First-Aid	Alberta Sports Medicine Council		Sports First-Aid 1 (CMH2130)	none	The emphasis on prevention of sports injuries includes caring for sports injuries and basic taping techniques
Advanced First-Aid Level II (100 hours)	St. John Ambulance	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Certified First-Aid Instructor Advanced II	Includes oxygen administration, extended first-aid and accident scene management
Oxygen Administration (10 hours)	St. John Ambulance	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Certified Oxygen Administration Instructor	Includes supplemental oxygen in emergencies, treatment of hypxia and safety measures in handling oxygen

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

3. COMMUNITY HEALTH RELATED AREAS (continued)

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
CPR Level C (12 hours)	The Canadian Red Cross Society St. John Ambulance		Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	CPR Instructors	Nationally recognized certification "Basic Rescuer" includes airway management and CPR for adults, child, infants and 2-rescuer adult CPR

4. CONSTRUCTION TECHNOLOGIES RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Explosive Actuated Tools	Technical Institute or College (post-secondary)		Concrete Work (CON3010)	EAT certificate	Required by OH&S for all operators to be certified Informal credentialling to be arranged through local post-secondary

5. ENERGY AND MINES RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
First-Aid Certification • Emergency First-Aid	St. John Ambulance The Canadian Red Cross Society	CTR	First-Aid/CPR (CMH2120)	Yes See *Community Health*	
First-Aid Certification • Standard First-Aid • Advanced First-Aid	St. John Ambulance The Canadian Red Cross Society	CMH	First-Aid/CPR (CMH2120)	Yes See *Community Health*	Three-year certificates recognized by Occupational Health and Safety; see Community Health strand for details

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

5. ENERGY AND MINES RELATED AREAS (continued)

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Petroleum Industry Training Programs • Petroleum Fundamentals • Hydrogen Sulphide Alive • Blowout Prevention • Floorman Training • Oilfield Maintenance	Petroleum Industry Training Service (PITS)		Conventional Oil & Gas 1 (ENM2020) Conventional Oil & Gas 2 (ENM3020) Supply and Distribution (ENM2080) Environmental Safety (ENM2100)	Yes Certified Instructors from Industry	Representative training programs that address standards accepted by industry and relevant regulatory agencies
Workplace Hazardous Materials Information System (WHMIS)	Occupational Health and Safety	CTR	Personal Safety Management (CTR1210)	Yes See *Career Transitions*	Addresses skills required to work safely around hazardous materials
Transportation of Dangerous Goods (TDG)	Occupational Health and Safety	CTR	Workplace Safety (Practices) (CTR2210)	Yes See *Career Transitions*	Addresses skills required by individuals involved with the transportation and handling of dangerous goods
Power Engineering Technology	Power Engineering Department, SAIT	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes (certified instructor from industry)	A modular and computer-enhanced learning program available through the SAIT Open Learning Instruction System (SOLIS)that links with Third Class Power Engineering

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

6. FOODS RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Food Sanitation and Hygiene	Alberta Health, Environmental Health Services	TOU	Food Safety and Sanitation (FOD2150)		Alberta Health, Environmental Health Services, Area Services Division, 14th Floor, 10025 Jasper Avenue, Box 1360, Edmonton, AB T5J 2N3

7. FORESTRY RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Alberta Conservation and Hunter Education Program	Alberta Environmental Protection, Fish and Wildlife Services	WLD	Hunting and Game Management 1 (WLD1070) Hunting and Game Management 2 (WLD2070)	Yes with Alberta Environmental Protection	Contact Alberta Environmental Protection, Fish and Wildlife Services for information regarding instructor and student certification
Alberta Fishing Education Program	Alberta Environmental Protection, Fish and Wildlife Services	WLD	Angling and Fish Management (WLD1080)	Yes with Alberta Environmental Protection	
Alberta Tourism Industry Standards • Outdoor Guide • Freshwater Angling Guide • Hunting Guide	Alberta Tourism Education Council (ATEC)		Woods Survival 1 (FOR1040) Woods Survival 2 (FOR2040)	None	Industry standards currently available – certification under development. Evaluation by industry peer-based or written exam and demonstration of practical skills.
Canadian Firearms Safety Course	Alberta Justice, Chief Provincial Firearms Office	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes with Alberta Justice	Contact Alberta Justice for information regarding instructor and student certification

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

7. FORESTRY RELATED AREAS (continued)

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Emergency First-Aid	St. John Ambulance The Canadian Red Cross Society Society	CTR	Personal Safety (Management) (CTR1210)	Yes	See *Community Health* and/or *Career Transitions*
Standard First-Aid	St. John Ambulance The Canadian Red Cross Society Society	CMH	First-Aid/CPR (CMH2120)	Yes	
Basic Wilderness First-Aid	The Canadian Red Cross Society Society	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes with The Canadian Red Cross Society	Evaluation done by instructor certified with The Canadian Red Cross Society.

8. TOURISM RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Tourism: Alberta Best	Alberta Tourism Education Council	FOD	Quality Guest Service (TOU1030)	Alberta Best Trainers	K, S and A of quality guest service. No renewal time frame

CREDENTIALLING OPPORTUNITIES IN CTS (continued)

9. WILDLIFE RELATED AREAS

Certificate	Agency	Other Strands	Modules	Instructor Qualifications	Comments
Alberta Conservation and Hunter Education Program	Alberta Environmental Protection, Fish and Wildlife Services		Hunting and Game Management 1 (WLD1070) Hunting and Game Management 2 (WLD2070)	Yes with Alberta Environmental Protection	Contact Alberta Environmental Protection, Fish and Wildlife Services, at for information regarding instructor and student certification
Alberta Fishing Education Program	Alberta Environmental Protection, Fish and Wildlife Services		Angling and Fish Management (WLD1080)	Yes Alberta with Environmental Protection	
Alberta Tourism Industry Standards • Outdoor Guide • Freshwater Angling Guide • Hunting Guide	Alberta Tourism Education Council (ATEC)	FOR	Outdoor Experiences 1 (WLD1030) Outdoor Experiences 2 (WLD2030)	None	Industry standards currently available – certification under development. Evaluation by industry peer-based or written exam and demonstration of practical skills.
Canadian Firearms Safety Course	Alberta Justice, Chief Provincial Firearms Office	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes with Alberta Justice	Contact Alberta Justice for information regarding instructor and student certification
Emergency First-Aid	St. John Ambulance The Canadian Red Cross Society	CTR	Personal Safety (Management) (CTR1210)	Yes	See *Community Health* and/or *Career Transitions*
Standard First-Aid	St. John Ambulance The Canadian Red Cross Society	CMH	First-Aid/CPR (CMH2120)	Yes	
Basic Wilderness First-Aid	The Canadian Red Cross Society Society	CTR	Practicum modules (CTR Practicum Modules A-E, CTR3040-3080)	Yes with The Canadian Red Cross Society	Evaluation done by instructor certified with The Canadian Red Cross Society.

APPRENTICESHIP ACCREDITATION OPPORTUNITIES IN CTS

AUTOMOTIVE SERVICE TECHNICIAN TRADE CTS ACCREDITATION AGREEMENT

Students that successfully complete 25 specified CTS modules related to the Automotive Service Technician trade may be credited with the first period of formal instruction along with the hours they have logged towards the trade.

In addition, students that successfully complete 35 specified CTS modules related to the Automotive Service Technician trade may be credited with the first and second periods of formal instruction and 525 hours of on-the-job training (375 hours for the first period and 150 hours for the second period) along with the hours they have logged towards the trade.

Refer to the first and second year lists of approved modules.

Conditions of the agreement:

- all CTS modules identified with a ■ in the approved lists must be delivered and assessed by a certificated journeyman instructor
- upon indenturing candidates would be permitted to challenge the appropriate theory examinations
- on-the-job time credits apply to students that have completed 35 approved modules in CTS (375 hours first period and 150 hours second period)
- additional logged hours earned in industry may be credited based upon the recommendation of the employer
- teachers responsible for the program must verify the successful completion of all of the required modules.

AUTOMOTIVE SERVICE TECHNICIAN TRADE

Record of Modules Completed
Mechanics and Related Modules★

Accredited by Apprenticeship Board, Advanced Education and Career Development
Toward the Automotive Service Technician Trade

FIRST PERIOD		
Modules Successfully Completed ✓	Module Number	Module Name
	MEC1020	Vehicle Service and Care
	MEC1040	Engine Fundamentals
	MEC1090	Electrical Fundamentals
	MEC1110	Pneumatics & Hydraulics
	MEC1130	Mechanical Systems
	MEC1150	Ride and Control Systems
	MEC1160	Structures and Materials
	FAB1040	Oxyacetylene Welding
	FAB1130	Principles of Machining
	MEC2020	Vehicle Maintenance■
	MEC2030	Lubrication and Cooling■
	MEC2060	Ignition Systems■
	MEC2090	Electrical Components■
	MEC2100	Power Assist Accessories■
	MEC2110	Braking Systems■
	MEC2120	Hydraulic Accessories■
	CTR2110	Brake Project■
	MEC2130	Drive Trains■
	MEC2140	Transmissions/Transaxels■
	MEC2150	Suspension Systems■
	MEC2160	Steering Systems■
	MEC3040	Engine Tune-up■
	CTR3110	Standard Transmission Project■
	MEC3150	Wheel Alignment■
	CTR3120	Wheel Alignment Project■

SECOND PERIOD		
Modules Successfully Completed ✓	Module Number	Module Name
	MEC2040	Fuel and Exhaust Systems■
	MEC2050	Alternative Fuel Engines■
	MEC2070	Emission Controls■
	MEC3030	Engine Diagnosis■
	MEC3050	Engine Replacement■
	MEC3060	Engine Reconditioning 1■
	MEC3070	Engine Reconditioning 2■
	CTR3130	Engine Components Project■
	MEC3140	Drive Train Repair■
	CTR3140	Rear Axle and Differential Project■

★ For a detailed description of the modules listed see the appropriate Guide to Standards and Implementation, available from the Learning Resources Distributing Centre, or on the Internet at http://ednet.edc.gov.ab.ca/cts/gsidocs.html.

■ Modules that must be delivered and assessed by a journeyman automotive service technician.

Student: ______________________
Supervising Teacher: ______________________
School: ______________________
School Telephone: ______________________
Principal's Signature: ______________________

Number of Modules Successfully Completed:
- First Period: ______
- Second Period: ______

Date Issued: ______________________
Journeyman Instructor's Signature: ______________________
Journeyman Certificate No.: ______________________

COOK TRADE
CTS ACCREDITATION AGREEMENT

Students that successfully complete 17 specified CTS modules related to the Cook trade may be credited with the first period of formal instruction.

In addition, students that successfully complete 30 specified CTS modules related to the Cook trade may be credited with the first and second periods of formal instruction and 450 hours of on-the-job training along with the hours they have logged towards the trade.

Refer to the first and second year lists of approved modules.

Conditions of the agreement:

- all CTS modules must be delivered and assessed by a certificated journeyman instructor
- all first period candidates will be required to have their Food Safe Provincial Certificate to qualify for writing the first period examination
- upon indenturing candidates would be permitted to challenge the appropriate theory examinations
- additional paid hours earned in industry may be credited based upon the recommendation of the employer
- teachers responsible for the program must sign a document verifying the completion of the required modules.

COOK TRADE

Record of Modules Completed
Foods and Related Modules★

Accredited by Apprenticeship Board, Advanced Education and Career Development
Toward the Cook Trade

FIRST PERIOD		
Modules Successfully Completed ✓	Module Number	Module Name
	FOD1010	Food Basics
	FOD1020	Baking Basics
	FOD1050	Fast & Convenience Foods
	FOD1060	Canadian Heritage Foods
	FOD2010	Food & Nutrition Basics
	FOD2040	Cake & Pastry
	FOD2050	Yeast Breads & Rolls
	FOD2060	Milk Products & Eggs
	FOD2070	Stocks, Soups & Sauces
	FOD2080	Vegetables/Fruits/Grains
	FOD2090	Creative Cold Foods
	FOD2100	Basic Meat Cookery
	FOD2110	Fish & Poultry
	FOD2130	Vegetarian Cuisine
	FOD2150	Food Safety & Sanitation◆
	FOD2170	International Cuisine 1
	FOD3090	Basic Meat Cutting

SECOND PERIOD		
Modules Successfully Completed ✓	Module Number	Module Name
	CTR2110	Canadian Heritage Foods Project Module
	CTR2120	Food & Nutrition Basics Project Module
	CTR3110	Vegetables/Fruits/Grains Project Module
	CTR3120	Fish & Poultry Project Module
	FOD3030	Creative Baking
	FOD3040	Advanced Yeast Products
	FOD3050	Advanced Soups & Sauces
	FOD3060	Food Presentation
	FOD3070	Short Order Cooking
	FOD3080	Advanced Meat Cookery
	FOD3100	Entertaining With Food
	FOD3110	Food Processing
	FOD3140	International Cuisine 2

★ For a detailed description of the modules listed see the appropriate Guide to Standards and Implementation, available from the Learning Resources Distributing Centre or on the Internet at http://ednet.edc.gov.ab.ca/cts/gsidocs.html.

◆ Certification requirement

Student: ____________________
Supervising Teacher: ____________________
School: ____________________
School Telephone: ____________________
Principal's Signature: ____________________

Number of Modules Successfully Completed:
- First Period: ______
- Second Period: ______

Date Issued: ____________________
Journeyman Instructor's Signature: ____________________
Journeyman Certificate No.: ____________________

HAIRSTYLIST TRADE
CTS ACCREDITATION AGREEMENT

Students that successfully complete 35 specified CTS modules related to the Hairstylist trade, may be credited with the first period of formal instruction and 525 hours of on-the-job training credits toward the first period of apprenticeship. Students may also challenge the 1st period examination.

In addition, students that successfully complete 55 specified CTS modules may be credited with the first and second periods of instruction and 1400 hours of on-the-job training toward the first period of apprenticeship. Students may also challenge the 2nd period examination. Refer to the list of approved modules.

Conditions of the agreement:

- journeyman certification requirements for each CTS module are specified in the Module Parameters section of the appropriate Guide to Standards and Implementation for each CTS strand
- all candidates with 35 credits are required to complete 875 hours of on-the-job training in the first period and 1400 hours in the second period of their apprenticeship in addition to the second period of formal instruction
- all candidates with 55 credits are required to complete 1400 hours of on-the-job training in the second period of their apprenticeship
- teachers responsible for the program must verify the successful completion of all of the designated modules.

HAIRSTYLIST TRADE

Record of Modules Completed
Cosmetology Studies and Related Modules★

Accredited by Apprenticeship Board, Advanced Education and Career Development
Toward the Hairstylist Trade
55 modules (55 credits)—35 Modules (35 credits) ◆

Modules Successfully Completed ✓	Module Number	Name
	COS1010*	Personal Images
	COS1020*	Hair Graphics 1
	COS1030*	Hair & Scalp Care 1
	COS1040*	Forming & Finishing 1
	COS1050*	Permanent Waving 1 (The Physical Process)
	COS1060*	Skin Care 1 (Basic Practices)
	COS1070*	Manicuring 1
	COS2010*	Hair Graphics 2
	COS2020*	Hair & Scalp Care 2
	COS2030*	Forming & Finishing 2
	COS2040*	Haircutting 1
	COS2050*	Hair Care & Cutting 1 (Client Services)
	COS2060*	Permanant Waving 2 (Cold Waving)
	COS2070*	Permanent Waving 3 (Heat-assisted)
	COS2080*	Permanent Waving 4 (Client Services)
	COS2090*	Colouring 1
	COS2100	Colour Removal 1
	COS2110	Colouring & Removal 1 (Client Services)
	COS2120*	Facials & Makeup 1
	COS2130*	Facials & Makeup 2 (Client Services)
	COS2140	Skin Care 2 (Client Services)
	COS2150*	Manicuring 2
	COS2170*	Manicuring 3 (Client Services)
	COS2180*	Hairpieces & Extensions
	COS2210*	Sales & Service 1 (Principles & Practices)
	DES1020*	The Design Process

Modules Successfully Completed ✓	Module Number	Name
	COS3010*	Professional Practices
	COS3020*	Long Hair Graphics
	COS3030*	Hair & Scalp Care 3
	COS3040*	Hair & Scalp Care 4 (Client Services)
	COS3050*	Haircutting 2
	COS3060*	Haircutting 3 (Client Services)
	COS3070*	Hair Care & Cutting 2 (Client Services)
	COS3080	Permanent Waving 5 (Designer)
	COS3090*	Relax/Straighten Hair
	COS3100*	Wave, Relax & Straighten Hair (Client Services)
	COS3110*	Colouring 2 (Permanent)
	COS3120	Colour Removal 2
	COS3130	Colouring & Removal 2 (Client Services)
	COS3140	Body Therapy
	COS3150	Hair Removal
	COS3160	Skin Care 3 (Client Services)
	COS3170*	Male Facial Grooming 1
	COS3180	Male Facial Grooming 2 (Client Services)
	COS3190	Nail Technology
	COS3200	Pedicuring
	COS3220	Wigs & Toupees
	COS3230	Hair Goods (Client Services)
	COS3260	Facial & Body Adornment
	COS3270	Creative Cosmetology
	ENT1010*	Challenge & Opportunity
	ENT1020	Planning a Venture
	ENT2010	Analyzing Ventures
	ENT2040	Implementing the Venture
	ENT3010	Managing the Venture

★ For a detailed description of the modules listed see the appropriate Guide to Standards and Implementation, available from the Learning Resources Distributing Centre or on the Internet at http://ednet.edc.gov.ab.ca/cts/gsidocs.html.

◆ The required 35 modules (35 credits) are those indicated by the *. All modules must be completed for 55 credits.

Student: ____________________
Supervising Teacher: ____________________
School: ____________________
School Telephone: ____________________
Principal's Signature: ____________________

Number of Modules Successfully Completed:
- First Period: ______
- Second Period: ______

Date Issued: ____________________
Journeyman Instructor's Signature: ____________________
Journeyman Certificate No.: ____________________

WELDER TRADE
CTS ACCREDITATION AGREEMENT

Students that successfully complete 25 specified CTS modules related to the Welder trade may be credited with the first period of formal instruction and the hours they have logged towards the trade. Refer to the list of approved modules.

Conditions of the agreement:

- all CTS modules identified with a ■ in the approved list must be delivered and assessed by a certificated journeyman instructor. Upon indenturing candidates would be permitted to challenge the appropriate theory examinations
- additional logged hours earned in industry may be credited based upon the recommendation of the employer
- teachers responsible for the program must verify the successful completion of the required modules.

WELDER TRADE

Record of Modules Completed
Fabrication Studies and Related Modules★

Accredited by Apprenticeship Board, Advanced Education and Career Development
Toward the Welder Trade

FIRST PERIOD		
Modules Successfully Completed ✓	**Module Number**	**Module Name**
	CON1010	Basic Tools & Materials
	FAB1040	Oxyacetylene Welding
	FAB1050	Basic Electrical Welding
	FAB1110	Bar and Tubular Fabrication
	FAB1100	Fabrication Principles
	FAB2020	Print Reading
	FAB2030	Oxyfuel Welding■
	FAB2040	Thermal Cutting■
	FAB2050	Arc Welding 1 (SMAW)■
	FAB2060	Arc Welding 2 (SMAW)■
	FAB2070	Gas Metal Arc Welding 1■
	FAB2160	Custom Fabrication■
	CTR2110	Project 2A - Practical Work■
	CTR2120	Project 2B - Practical Work■
	FAB3020	Metallurgy Fundamentals
	FAB3050	Arc Welding 3 (SMAW)■
	FAB3060	Arc Welding 4 (SMAW)■
	FAB3170	Gas Metal Arc Welding 2■
	FAB3070	Pipe & Tubular Welding■
	FAB3040	Specialized Welding■
	FAB3160	Prefabrication Principles■
	CTR3110	Project 3A - Practical Work■
	CTR3120	Project 3B - Practical Work■
	DES1010	Sketch, Draw & Model
	DES2040	Drafting/Design Applications

★ For a detailed description of the modules listed see the appropriate Guide to Standards and Implementation, available from the Learning Resources Distributing Centre or on the Internet at http://ednet.edc.gov.ab.ca/cts/gsidocs.html.

■ Modules that must be delivered and assessed by a journeyman welder.

Student: ______________________

Supervising Teacher: ______________________

School: ______________________

School Telephone: ______________________

Principal's Signature: ______________________

Number of Modules Successfully Completed:

- First Period: ______
- Second Period: ______

Date Issued: ______________________

Journeyman Instructor's Signature: ______________________

Journeyman Certificate No.: ______________________

CREDENTIALLING CONTACTS TELEPHONE/FAX NUMBERS

Alberta Agriculture Food and Rural Development		(403) 427–2173
Alberta Environmental Protection		(403) 944–0313
Fish and Wildlife Services		(403) 297–6423
Alberta Family and Social Services		(403) 422–1119
Alberta Health, Environmental Health Services,		(403) 427–2643
Area Services Division		(fax) (403) 422–9681
Alberta Justice Chief Provincial Firearms Office		(403) 427–0437
Alberta Sports Medicine Council		(403) 453–8636
Alberta Tourism Education Council (ATEC)		1–800–265–1283
Canadian Red Cross		
	Calgary	(403) 541–4445
	Edmonton	(403) 423–2680
	Lethbridge	(403) 327–7117
	Grande Prairie	(403) 539–7127
	Medicine Hat	(403) 526–3048
	Red Deer	(403) 346–1241
Olds College Extension Services,		(403) 556–8344
Flowers Canada The Association of the Canadian Floral Industry		(519) 823–2670
Flowers Canada Alberta Region		(403) 672–2553
Job Safety Skills Society		(403) 423–6556 (403) 423–8388
Lakeland College Continuing Education		(403) 853–8444
Occupational Health and Safety		
Petroleum Industry Training Services (PPTS)	Calgary	(403) 250–9606
	Nisku	(403) 955–7770
SAIT, Power Engineering Department Energy and Natural Resources Department		(403) 284–7183
SAIT Energy and Natural Resources Department		(403) 284–7183
St. John Ambulance		1–800–665–7114

NB: Alberta Government Offices can be reached toll free throughout Alberta during normal working hours by dialing the Alberta Government RITE system (310–0000) and asking the operator for the department telephone number.

APPRENTICESHIP CONTACTS TELEPHONE/FAX NUMBERS

Alberta Career Development Centers:

Bonnyville Career Development Centre		(403) 826-4175
	Fax	(403) 826-1904
Calgary Career Development Centre		(403) 297-6457
	Fax	(403) 297-4492
Calgary Canada/Alberta Service Centre		(403) 258-4711
	Fax	(403) 258-4719
Camrose Career Development Centre		(403) 679-1475
	Fax	(403) 679-4719
Edmonton Career Development Centre		(403) 427-8517
	Fax	(403) 422-3734
Edmonton Canada/Alberta Service Centre		(403) 438-8260
	Fax	(403) 427-2343
Fort McMurray Career Development Centre		(403) 743-7192
	Fax	(403) 743-7492
Grande Prairie Career Development Centre		(403) 538-5240
	Fax	(403) 538-5237
Hinton Career Development Centre		(403) 865-8293
	Fax	(403) 865-8269
Lethbridge/Alberta Service Centre		(403) 381-5380
	Fax	(403) 381-5795
Medicine Hat Career Development Centre		(403) 529-3580
	Fax	(403) 529-3564
Peace River Career Development Centre		(403) 624-6211
	Fax	(403) 624-6476
Red Deer Career Development Centre		(403) 340-5151
	Fax	(403) 340-7086
Slave Lake Career Development Centre		(403) 849-7220
	Fax	(403) 849-7379
Vermillion Career Development Centre		(403) 853-8150
	Fax	(403) 853-8203

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